United States
Environmental Protection
Agency

Solid Waste and
Emergency Response
(5305)

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EPA

Setting Priorities for Hazardous Waste Minimization

Appendices

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APPENDIX 1
SAMPLE BRS DATA FORMS

Form IC
Form GM
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BEFORE COMPLETING FORM, ATTACH SITE IDENTIFICATION LABEL OR ENTER:

SITE NAME _____

_____

EPA ID NO. | | | | | | | | | | | | |

U.S. ENVIRONMENTAL PROTECTION AGENCY

1991 Hazardous Waste Report

FORM

IC

IDENTIFICATION AND CERTIFICATION

INSTRUCTIONS: Read the detailed instructions beginning on page 6 of the 1991 Hazardous Waste Report booklet before completing this form.

SEC. I Site name and location address. Complete items A through H. Check the box ☒ in items A, C, E, F, G, and H if same as label; if different, enter corrections. If label is absent, enter information. Instruction page 6

A. EPA ID No. Same as label ☐ or → | | | | | | | | | | | | |

B. County

C. Site/Company name Same as label ☐ or →

D. Has the site name associated with this EPA ID changed since 1989? ☐ 1 Yes ☐ 2 No

E. Street name and number. If not applicable, enter industrial park, building name or other physical location description. Same as label ☐ or →

F. City, town, village, etc. Same as label ☐ or →

G. State Same as label ☐ | |

H. Zip Code Same as label ☐ | | | | | – | | | | |

SEC. II Mailing address of site. Instruction page 6

A. Is the mailing address the same as the location address? ☐ 1 Yes (SKIP TO SEC. III) ☐ 2 No (GO TO BOX B)

B. Number and street name of mailing address

C. City, town, village, etc.

D. State | |

E. Zip Code | | | | | – | | | | |

SEC. III Name, title, and telephone number of the person who should be contacted if questions arise regarding this report. Instruction page 6

A. Please print: Last name First name M.I.

B. Title

C. Telephone | | | | – | | | | | | | Extension | | | |

SEC. IV Enter the Standard Industrial Classification (SIC) Code that describes the principal products, group of products, produced or distributed or the services rendered at the site's physical location. Enter more than one SIC Code only if no one industry description includes the combined activities of the site. Instruction page 7

A. | | | | B. | | | | C. | | | | D. | | | |

SEC. V "I certify under penalty of law that this document and all attachments were prepared under my direction or supervision in accordance with a system designed to assure that qualified personnel properly gather and evaluate the information submitted. Based on my inquiry of the person or persons who manage the system, or those persons directly responsible for gathering the information, the information submitted is, to the best of my knowledge and belief, true, accurate and complete. I am aware that there are significant penalties under Section 3008 of the Resource Conservation and Recovery Act for submitting false information, including the possibility of fine and imprisonment for knowing violations."

A. Please print: Last name First name M.I.

B. Title

C. Signature

D. Date of signature | | MO. | | DAY | | YR.

A. 1991 RCRA generator status
Instruction page 7
(CHECK ONE BOX BELOW)

- ☐ 1 LQG
- ☐ 2 SQG
- ☐ 3 CESQG
- ☐ 4 Non generator (CONTINUE TO BOX B)

(SKIP TO SEC. VII)

B. Reason for not generating
Page 9
(CHECK ALL THAT APPLY)

- ☐ 1 Never generated
- ☐ 2 Out of business
- ☐ 3 Only excluded or delisted waste
- ☐ 4 Only non-hazardous waste
- ☐ 5 Periodic or occasional generator
- ☐ 6 Waste minimization activity
- ☐ 7 Other (SPECIFY COMMENTS IN BOX 8

Sec. VII - On-Site Waste Management Status

A. RCRA permitted or interim status storage
Instruction page 10
☐

B. RCRA permitted or interim status treatment, disposal, or recycling
Page 10
☐

C. RCRA-exempt treatment, disposal, or recycling
Page 11
☐

Sec. VIII - Waste Minimization Activity during 1990 or 1991

A. Did this site begin or expand a source reduction activity during 1990 or 1991?
Instruction page 11

- ☐ 1 Yes
- ☐ 2 No

B. Did this site begin or expand a recycling activity during 1990 or 1991?
Page 12

- ☐ 1 Yes
- ☐ 2 No

C. Did this site systematically investigate opportur for source reduction or recycling during 1990 or
Page 12

- ☐ 1 Yes
- ☐ 2 No

D. Did any of the factors listed below delay or limit this site's ability to initiate new or additional source reduction activities in 1990 or 1991?
Page 12
(CHECK YES OR NO FOR EACH ITEM)

Yes	No		
☐1	☐ 2	a.	Insufficient capital to install new source reduction equipment or implement new source reduction practices
☐1	☐ 2	b.	Lack of technical information on source reduction techniques applicable to the specific production processes
☐1	☐ 2	c.	Source reduction is not economically feasible: cost savings in waste management or production will not recover the capital investment
☐1	☐ 2	d.	Concern that product quality may decline as a result of source reduction
☐1	☐ 2	e.	Technical limitations of the production processes
☐1	☐ 2	f.	Permitting burdens
☐1	☐ 2	g.	Source reduction previously implemented - additional reduction does not appear to be technically feasible
☐1	☐ 2	h.	Source reduction previously implemented - additional reduction does not appear to be economically feasible
☐1	☐ 2	i.	Source reduction previously implemented - additional reduction does not appear to be feasible due to permitting requirement
☐1	☐ 2	j.	Other (SPECIFY COMMENTS IN BOX BELOW)

E. Did any of the factors listed below delay or limit this site's ability to initiate new or additional on-site or off-site recycling activities during 1990 or
Page 12
(CHECK YES OR NO FOR EACH ITEM)

Yes	No		
☐1	☐ 2	a.	Insufficient capital to install new recycling equipment or implement new recycling practice
☐1	☐ 2	b.	Lack of technical information on recycling techniques applicable to this site's specific production processes
☐1	☐ 2	c.	Recycling is not economically feasible: cost savings in waste management or production will not recover the capital investment
☐1	☐ 2	d.	Concern that product quality may decline as a result of recycling
☐1	☐ 2	e.	Requirements to manifest wastes inhibit shipments off site for recycling
☐1	☐ 2	f.	Financial liability provisions inhibit shipments off site for recycling
☐1	☐ 2	g.	Technical limitations of production processes inhibit shipments off site for recycling
☐1	☐ 2	h.	Technical limitations of production processes inhibit on-site recycling
☐1	☐ 2	i.	Permitting burdens inhibit recycling
☐1	☐ 2	j.	Lack of permitted off-site recycling facilities
☐1	☐ 2	k.	Unable to identify a market for recyclable materials
☐1	☐ 2	l.	Recycling previously implemented - additional recycling does not appear to be technically feasible
☐1	☐ 2	m.	Recycling previously implemented - additional recycling does not appear to be economically feasi
☐1	☐ 2	n.	Recycling previously implemented - additional recycling does not appear to be feasible due to permitting requirements
☐1	☐ 2	o.	Other (SPECIFY COMMENTS IN BOX BELOW)

Comments:

BEFORE COPYING FORM, ATTACH SITE IDENTIFICATION LABEL OR ENTER:

SITE NAME _____

_____

EPA ID NO. |_|_| |_|_| |_|_| |_|_|

U.S. ENVIRONMENTAL PROTECTION AGENCY

1991 Hazardous Waste Report

FORM **GM**

WASTE GENERATION AND MANAGEMENT

INSTRUCTIONS: Read the detailed instructions beginning on page 13 of the 1991 Hazardous Waste Report booklet before completing this form.

Sec. I

A. Waste description — Instruction Page 15

B. EPA hazardous waste code — Page 15 |_|_|_| |_|_|_| |_|_|_| |_|_|_| |_|_|_|

C. State hazardous waste code — Page 15 |_|_|_|_|_| |_|_|_|_|_|

D. SIC code — Page 16 |_|_|_|_|

E. Origin code |_| — Page 16 — System type |M|_|_|

F. Source code — Page 17 |A|_|_|

G. Point of measurement — Page 17 |_|

H. Form code — Page 17 |B|_|_|

I. RCRA-radioactive mixed — Page 17 |_|

J. Reported TRI constituent — Page 16 |_|

K. CAS numbers — Page 16
1. |_|_|_|_|_|-|_|_|-|_| 2. |_|_|_|_|_|-|_|_|-|_|
3. |_|_|_|_|_|-|_|_|-|_| 4. |_|_|_|_|_|-|_|_|-|_| 5. |_|_|_|_|_|-|_|_|-|_|

Sec. II

A. Quantity generated in 1990 — Instruction Page 18 |_|_|_|_|_|_|_|_|.|_|

B. Quantity generated in 1991 — Page 18 |_|_|_|_|_|_|_|_|.|_|

C. UOM — Page 19 |_| Density |_|_|.|_| ☐ 1 lbs/gal ☐ 2 sg

D. Did this site do any of the following to this waste: treat on site, dispose on site, recycle on site, or discharge to a sewer/POTW? — Page 19
☐ 1 Yes (CONTINUE TO SYSTEM 1)
☐ 2 No (SKIP TO SEC. III)

ON-SITE SYSTEM 1

On-site system type — Page 19 |M|_|_|

Quantity treated, disposed or recycled on site in 1991 |_|_|_|_|_|_|_|_|.|_|

ON-SITE SYSTEM 2

On-site system type — Page 19 |M|_|_|

Quantity treated, disposed or recycled on site in 1991 |_|_|_|_|_|_|_|_|.|_|

Sec. III

A. Was any of this waste shipped off site in 1991? — Instruction Page 20
☐ 1 Yes (CONTINUE TO BOX B)
☐ 2 No (SKIP TO SEC. IV)

Site 1

B. EPA ID No. of facility waste was shipped to — Page 20 |_|_|_| |_|_|_| |_|_|_| |_|_|_|

C. System type shipped to — Page 20 |M|_|_|

D. Off-site availability code — Page 21 |_|

E. Total quantity shipped in 1991 — Page 21 |_|_|_|_|_|_|_|_|.|_|

Site 2

B. EPA ID No. of facility waste was shipped to — Page 20 |_|_|_| |_|_|_| |_|_|_| |_|_|_|

C. System type shipped to — Page 20 |M|_|_|

D. Off-site availability code — Page 21 |_|

E. Total quantity shipped in 1991 — Page 21 |_|_|_|_|_|_|_|_|.|_|

Sec. IV

A. Did new activities in 1991 result in minimization of this waste? — Instruction Page 22
☐ 1 Yes (CONTINUE TO BOX B)
☐ 2 No (THIS FORM IS COMPLETE)

B. Activity — Page 22 |W|_|_| |W|_|_| |W|_|_| |W|_|_|

C. Other effects — Page 22
☐ 1 Yes
☐ 2 No

D. Quantity recycled in 1991 due to new activities — Page 23 |_|_|_|_|_|_|_|_|.|_|

E. Activity/production index — Page 23 |_|_|.|_|

F. 1991 Source reduction quantity — Page 24 |_|_|_|_|_|_|_|_|.|_|

Comments:

BEFORE COPYING FORM, ATTACH SITE IDENTIFICATION LABEL OR ENTER:

SITE NAME _____

_____

EPA ID NO. |_|_|_|_|_|_|_|_|_|_|_|_|

U.S. ENVIRONMENTAL PROTECTION AGENCY

1991 Hazardous Waste Report

FORM **WR**

WASTE RECEIVED FROM OFF SIT

INSTRUCTIONS: Read the detailed instructions beginning on page 29 of the 1991 Hazardous Waste Report booklet before completing this form

Waste 1

A. Description of hazardous waste — Instruction Page 28

B. EPA hazardous waste code — Page 30

C. State hazardous waste code — Page 30

D. Off-site source EPA ID No. — Page 30

E. Quantity received in 1991 — Page 30

F. UOM — Page 30

Density

☐ 1 lbs/gal ☐ 2 sg

G. Waste form code — Page 31 — B

H. RCRA-radioactive mixed — Page 31

I. System type — Page 31 — M

Waste 2

A. Description of hazardous waste — Instruction Page 28

B. EPA hazardous waste code — Page 30

C. State hazardous waste code — Page 30

D. Off-site source EPA ID No. — Page 30

☐ Check if ID same as in Waste 1

or-> |_|_|_|_|_|_|_|_|_|_|_|_|

E. Quantity received in 1991 — Page 30

F. UOM — Page 30

Density

☐ 1 lbs/gal ☐ 2 sg

G. Waste form code — Page 31 — B

H. RCRA-radioactive mixed — Page 31

I. System type — Page 31 — M

Waste 3

A. Description of hazardous waste — Instruction Page 28

B. EPA hazardous waste code — Page 30

C. State hazardous waste code — Page 30

D. Off-site source EPA ID No. — Page 30

☐ Check if ID same as in Waste 2

or-> |_|_|_|_|_|_|_|_|_|_|_|_|

E. Quantity received in 1991 — Page 30

F. UOM — Page 30

Density

☐ 1 lbs/gal ☐ 2 sg

G. Waste form code — Page 31 — B

H. RCRA-radioactive mixed — Page 31

I. System type — Page 31 — M

Comments:

Page ____ of ____

BEFORE COPYING FORM, ATTACH SITE IDENTIFICATION LABEL OR ENTER:

SITE NAME ________________________

____

EPA ID NO. [ ][ ][ ][ ] [ ][ ][ ][ ] [ ][ ][ ][ ]

U.S. ENVIRONMENTAL PROTECTION AGENCY

1991 Hazardous Waste Report

FORM PS

WASTE TREATMENT, DISPOSAL, OR RECYCLING PROCESS SYSTEMS

INSTRUCTIONS: Read the detailed instructions beginning on page 32 of the 1991 Hazardous Waste Report booklet before completing this form.

Sec. I

A. Waste treatment, disposal or recycling system description
Instruction Page 38

B. System type
Page 38
M[ ][ ][ ]

C. Regulatory status
Page 38

D. Operational status
Page 39

E. Unit types
Page 39

Sec. II

A. 1991 influent quantity
Instruction Page 40

UOM Density

Total [ ] • [ ] [ ] [ ] • [ ]

RCRA [ ] • [ ] ☐ 1 lbs/gal ☐ 2 sg

B. Maximum operational capacity
Page 41

Total [ ] • [ ]

RCRA [ ] • [ ]

C. 1991 liquid effluent quantity
Page 42

UOM Density

Total [ ] • [ ] [ ] [ ] • [ ]

RCRA [ ] • [ ] ☐ 1 lbs/gal ☐ 2 sg

D. 1991 solid/sludge residual quantity
Page 43

UOM Density

Total [ ] • [ ] [ ] [ ] • [ ]

RCRA [ ] • [ ] ☐ 1 lbs/gal 2 ☐ sg

E. Limitations on maximum operational capacity
Page 44

1. [ ] 2. [ ] 3. [ ]

F. Commercial capacity availability code
Page 44

G. Percent capacity commercially available
Page 45

[ ] %

Sec. III

A. Planned change in maximum operational capacity
Instruction Page 46

☐ 1 Yes (CONTINUE TO BOX B)

☐ 2 No (THIS FORM IS COMPLETE)

B. New maximum operational capacity
Page 46

UOM

Total [ ] • [ ] [ ]

RCRA [ ] • [ ]

C. Planned year of change
Page 46

1 9 [ ][ ]

D. Future commercial capacity availability code
Page 46

E. Percent future capacity commercially available
Page 46

[ ] %

Comments:

Page ____ of ____

BEFORE COPYING FORM, ATTACH SITE IDENTIFICATION LABEL OR ENTER:

SITE NAME _____

_____

EPA ID NO. _____

U.S. ENVIRONMENTAL PROTECTION AGENCY

1991 Hazardous Waste Report

FORM **OI**

OFF-SITE IDENTIFICATION

INSTRUCTIONS: Read the detailed instructions on the back of this page before completing this form.

Site 1

A. EPA ID No. of off-site installation or transporter

B. Name of off-site installation or transporter

C. Handler type (CHECK ALL THAT APPLY)

- ☐ Generator
- ☐ Transporter
- ☐ TSDR

D. Address of off-site installation

Street _____

City _____ State ___ Zip Code _____-_____

Site 2

A. EPA ID No. of off-site installation or transporter

B. Name of off-site installation or transporter

C. Handler type (CHECK ALL THAT APPLY)

- ☐ Generator
- ☐ Transporter
- ☐ TSDR

D. Address of off-site installation

Street _____

City _____ State ___ Zip Code _____-_____

Site 3

A. EPA ID No. of off-site installation or transporter

B. Name of off-site installation or transporter

C. Handler type (CHECK ALL THAT APPLY)

- ☐ Generator
- ☐ Transporter
- ☐ TSDR

D. Address of off-site installation

Street _____

City _____ State ___ Zip Code _____-_____

Site 4

A. EPA ID No. of off-site installation or transporter

B. Name of off-site installation or transporter

C. Handler type (CHECK ALL THAT APPLY)

- ☐ Generator
- ☐ Transporter
- ☐ TSDR

D. Address of off-site installation

Street _____

City _____ State ___ Zip Code _____-_____

Site 5

A. EPA ID No. of off-site installation or transporter

B. Name of off-site installation or transporter

C. Handler type (CHECK ALL THAT APPLY)

- ☐ Generator
- ☐ Transporter
- ☐ TSDR

D. Address of off-site installation

Street _____

City _____ State ___ Zip Code _____-_____

Comments:

BEFORE COPYING FORM, ATTACH SITE IDENTIFICATION LABEL OR ENTER:

SITE NAME _____

_____

EPA ID NO. |_|_|_|_|_|_|_|_|_|_|_|_|

U.S. ENVIRONMENTAL PROTECTION AGENCY

1991 Waste Minimization Report

FORM **WM**

WASTE MINIMIZATION

INSTRUCTIONS: Read the detailed instructions beginning on page 9 of the 1991 Waste Minimization Report booklet before completing this form.

Sec. I

A. Waste description — Instruction Page 11

EPA hazardous waste code — Page 11 |_|_|_| |_|_|_| |_|_|_| |_|_|_| |_|_|_|

C. State hazardous waste code — Page 12 |_|_|_|_|_|_| |_|_|_|_|_|_|

B. SIC code — Page 12 |_|_|_|_|

E. Origin code — Page 12 |_| System type |M|_|_|

F. Source code — Page 13 |A|_|_|

G. Point of measurement — Page 13 |_|

H. Form code — Page 13 |B|_|_|

I. RCRA-radioactive mixed — Page 13 |_|

J. Reported TRI constituent — Page 13 |_|

K. CAS numbers — Page 14
1. |_|_|_|_|_|_|-|_|_|-|_| 2. |_|_|_|_|_|_|-|_|_|-|_|
3. |_|_|_|_|_|_|-|_|_|-|_| 4. |_|_|_|_|_|_|-|_|_|-|_| 5. |_|_|_|_|_|_|-|_|_|-|_|

Sec. II

A. Quantity generated in 1990 — Instruction Page 14 |_|_|_|_|_|_|_|_|.|_|

B. Quantity generated in 1991 — Page 14 |_|_|_|_|_|_|_|_|.|_|

C. UOM — Page 14 |_| Density |_|_|.|_|
☐ 1 lbs/gal ☐ 2 sg

D. Was this waste recycled in 1991? — Page 15
☐ 1 Yes (CONTINUE TO BOX E)
☐ 2 No (SKIP TO SEC. III)

E. On-site recycling — Page 15
Quantity recycled on site in 1991 |_|_|_|_|_|_|_|_|.|_|

F. Off-site recycling — Page 15
Quantity recycled off site in 1991 |_|_|_|_|_|_|_|_|.|_|

Sec. III

A. Activity — Page 15 |W|_|_| |W|_|_| |W|_|_| |W|_|_|

B. Other effects — Page 15
☐ 1 Yes
☐ 2 No

C. Quantity recycled in 1991 due to new activities — Page 16 |_|_|_|_|_|_|_|_|.|_|

D. Activity/production index — Page 16 |_|_|.|_|

E. Source reduction quantity — Page 17 |_|_|_|_|_|_|_|_|.|_|

Comments:

APPENDIX 2
BRS CODE DESCRIPTIONS

EPA Hazardous Waste Codes
Source Codes
Form Codes
SIC Codes
Origin Codes

EPA HAZARDOUS WASTE CODES

Code	Waste description
CHARACTERISTIC HAZARDOUS WASTE	
D001	Ignitable waste
D002	Corrosive waste
D003	Reactive waste
D004	Arsenic
D005	Barium
D006	Cadmium
D007	Chromium
D008	Lead
D009	Mercury
D010	Selenium
D011	Silver
D012	Endrin(1,2,3,4,10,10-hexachloro-1,7-epoxy-1,4,4a,5,6,7,8,8a-octahydro-1,4-endo, endo-5,8-dimeth-ano-naphthalene)
D013	Lindane (1,2,3,4,5,6-hexa-chlorocyclohexane, gamma isomer)
D014	Methoxychlor (1,1,1-trichloro-2,2-bis [p-methoxyphenyl] ethane)
D015	Toxaphene (C_{10} H_{10} Cl_N, Technical chlorinated camphene, 67-69 percent chlorine)
D016	2,4-D (2,4-Dichlorophenoxyacetic acid)
D017	2,4,5-TP Silvex (2,4,5-Trichlorophenoxypropionic acid)
D018	Benzene
D019	Carbon tetrachloride
D020	Chlordane
D021	Chlorobenzene
D022	Chloroform
D023	o-Cresol
D024	m-Cresol
D025	p-Cresol
D026	Cresol
D027	1,4-Dichlorobenzene
D028	1,2-Dichloroethane
D029	1,1-Dichloroethylene
D030	2,4-Dinitrotoluene
D031	Heptachlor (and its epoxide)
D032	Hexachlorobenzene
D033	Hexachlorobutadiene
D034	Hexachloroethane
D035	Methyl ethyl ketone
D036	Nitrobenzene
D037	Pentachlorophenol
D038	Pyridine
D039	Tetrachloroethylene
D040	Trichloroethylene
D041	2,4,5-Trichlorophenol
D042	2,4,6-Trichlorophenol
D043	Vinyl chloride
HAZARDOUS WASTE FROM NONSPECIFIC SOURCES	
F001	The following spent halogenated solvents used in degreasing: Tetrachloroethylene, trichlorethylene, methylene chloride, 1,1,1-trichloroethane, carbon tetrachloride and chlorinated fluorocarbons; all spent solvent mixtures/blends used in degreasing containing, before use, a total of ten percent or more (by volume) of one or more of the above halogenated solvents or those solvents listed in F002, F004, and F005; and still bottoms from the recovery of these spent solvents and spent solvent mixtures.

EPA HAZARDOUS WASTE CODES
(Continued)

Code	Waste description
F002	The following spent halogenated solvents: Tetrachloroethylene, methylene chloride, trichloroethylene, 1,1,1-trichloroethane, chlorobenzene, 1,1,2-trichloro-1,2,2-trifluoroethane, ortho-dichlorobenzene, trichlorofluoromethane, and 1,1,2, trichloroethane; all spent solvent mixtures/blends containing, before use, a total of ten percent or more (by volume) of one or more of the above halogenated solvents or those solvents listed in F001, F004, and F005; and still bottoms from the recovery of these spent solvents and spent solvent mixtures.
F003	The following spent non-halogenated solvents: Xylene, acetone, ethyl acetate, ethyl benzene, ethyl ether, methyl isobutyl ketone, n-butyl alcohol, cyclohexanone, and methanol; all spent solvent mixtures/ blends containing, before use, only the above spent non-halogenated solvents; and all spent solvent mixtures/blends containing, before use, one or more of the above non-halogenated solvents, and a total of ten percent or more (by volume) of one or more of those solvents listed in F001, F002, F004, and F005; and still bottoms from the recovery of these spent solvents and spent solvent mixtures.
F004	The following spent non-halogenated solvents: cresols, cresylic acid, and nitrobenzene; all spent solvent mixtures/blends containing, before use, a total of ten percent or more (by volume) of one or more of the above non-halogenated solvents or those solvents listed in F001, F002, and F005; and still bottoms from the recovery of these spent solvents and spent solvent mixtures.
F005	The following spent non-halogenated solvents: toluene, methyl ethyl ketone, carbon disulfide, isobutanol, pyridine, benzene, 2-ethoxyethanol, and 2-nitropropane; all spent solvent mixtures/blends containing, before use, a total of ten percent or more (by volume) of one or more of the above non-halogenated solvents or those solvents listed in F001, F002, or F004; and still bottoms from the recovery of these spent solvents and spent solvent mixtures.
F006	Wastewater treatment sludges from electroplating operations except from the following processes: (1) sulfuric acid anodizing of aluminum; (2) tin plating on carbon steel; (3) zinc plating (segregated basis) on carbon steel; (4) aluminum or zinc-aluminum plating on carbon steel; (5) cleaning/stripping associated with tin, zinc, and aluminum plating on carbon steel; and (6) chemical etching and milling of aluminum.
F007	Spent cyanide plating bath solutions from electroplating operations.
F008	Plating bath residues from the bottom of plating baths from electroplating operations in which cyanides are used in the process.
F009	Spent stripping and cleaning bath solutions from electroplating operations in which cyanides are used in the process.
F010	Quenching bath residues from oil baths from metal heat treating operations in which cyanides are used in the process.
F011	Spent cyanide solutions from salt bath pot cleaning from metal heat treating operations.
F012	Quenching wastewater treatment sludges from metal heat treating operations in which cyanides are used in the process.

EPA HAZARDOUS WASTE CODES
(Continued)

Code	Waste description
F019	Wastewater treatment sludges from the chemical conversion coating of aluminum except from zirconium phosphating in aluminum can washing when such phosphating is an exclusive conversion coating process.
F020	Wastes (except wastewater and spent carbon from hydrogen chloride purification) from the production or manufacturing use (as a reactant, chemical intermediate, or component in a formulating process) of tri- or tetrachlorophenol or of intermediates used to produce their pesticide derivatives. (This listing does not include wastes from the production of hexachlorophene from highly purified 2,4,5-trichlorophenol.)
F021	Wastes (except wastewater and spent carbon from hydrogen chloride purification) from the production or manufacturing use (as a reactant, chemical intermediate, or component in a formulating process) of pentachlorophenol, or of intermediates used to produce derivatives.
F022	Wastes (except wastewater and spent carbon from hydrogen chloride purification) from the manufacturing use (as a reactant, chemical intermediate, or component in a formulating process) of tetra-, penta-, or hexachlorobenzenes under alkaline conditions.
F023	Wastes (except wastewater and spent carbon from hydrogen chloride purification) from the production of materials on equipment previously used for the production or manufacturing use (as a reactant, chemical intermediate, or component in a formulating process) of tri- and tetrachlorophenols. (This listing does not include wastes from equipment used only for the production or use of hexachlorophene from highly purified 2,4,5-trichlorophenol.)
F024	Process wastes including, but not limited to, distillation residues, heavy ends, tars, and reactor clean-out wastes, from the production of certain chlorinated aliphatic hydrocarbons by free radical catalyzed processes. These chlorinated aliphatic hydrocarbons are those having carbon chain lengths ranging from one to and including five, with varying amounts and positions of chlorine substitution. (This listing does not include wastewaters, wastewater treatment sludges, spent catalysts, and wastes listed in Sections 261.31. or 261.32)
F025	Condensed light ends, spent filters and filter aids, and spent desiccant wastes from the production of certain chlorinated aliphatic hydrocarbons, by free radical catalyzed processes. These chlorinated aliphatic hydrocarbons are those having carbon chain lengths ranging from one, to and including five, with varying amounts and positions of chlorine substitution.
F026	Wastes (except wastewater and spent carbon from hydrogen chloride purification) from the production of materials on equipment previously used for the manufacturing use (as a reactant, chemical intermediate, or component in a formulating process) of tetra-, penta-, or hexachlorobenzene under alkaline conditions.
F027	Discarded unused formulations containing tri-, tetra-, or pentachlorophenol or discarded unused formulations containing compounds derived from these chlorophenols. (This listing does not include formulations containing hexachlorophene synthesized from prepurified 2,4,5-trichlorophenol as the sole component.)
F028	Residues resulting from the incineration or thermal treatment of soil contaminated with EPA hazardous waste nos. F020, F021, F022, F023, F026, and F027.

EPA HAZARDOUS WASTE CODES
(Continued)

Code	Waste description
F032	Wastewaters, process residuals, preservative drippage, and spent formulations from wood preserving processes generated at plants that currently use, or have previously used, chlorophenolic formulations [except potentially cross-contaminated wastes that have had the F032 waste code deleted in accordance with Section 261.35 (i.e., the newly promulgated equipment cleaning or replacement standards), and where the generator does not not resume or initiate use of chlorophenolic formulations]. This listing does not include K001 bottom sediment sludge from the treatment of wastewater from wood preserving processes that use creosote and/or pentachlorophenol.
F034	Wastewaters, process residuals, preservative drippage, and spent formulations from wood preserving processes generated at plants that use creosote formulations. This listing does not include K001 bottom sediment sludge from the treatment of wastewater from wood preserving processes that use creosote and/or pentachlorophenol.
F035	Wastewaters, process residuals, preservative drippage, and spent formulations from wood preserving processes generated at plants that use inorganic preservatives containing arsenic or chromium. This listing does not include K001 bottom sediment sludge from the treatment of wastewater from wood preserving processes that use creosote and/or pentachlorophenol.
F037	Petroleum refinery primary oil/water/solids separation sludge - Any sludge generated from the gravitational separation of oil/water/solids during the storage or treatment of process wastewaters and oily cooling wastewaters from petroleum refineries. Such sludges include, but are not limited to, those generated in oil/water/solids separators; tanks and impoundments; ditches and other conveyances; sumps; and storm water units receiving dry weather flow. Sludges generated in storm water units that do not receive dry weather flow, sludges generated in aggressive biological treatment units as defined in Section 261.31(b)(2)(including sludges generated in one or more additional units after wastewaters have been treated in aggressive biological treatment units), and K051 wastes are exempted from this listing.
F038	Petroleum refinery secondary (emulsified) oil/water/solids separation sludge - Any sludge and/or float generated from the physical and/or chemical separation of oil/water/solids in process wastewaters and oily cooling wastewaters from petroleum refineries. Such wastes include, but are not limited to, all sludges and floats generated in induced air flotation (IAF) units, tanks and impoundments, and all sludges generated in DAF units. Sludges generated in stormwater units that do not receive dry weather flow, sludges generated in aggressive biological treatment units as defined in Section 261.31(b)(2) (including sludges generated in one or more additional units after wastewaters have been treated in aggressive biological treatment units), and F037, K048, and K051 wastes are exempted from this listing.
F039	Leachate resulting from the treatment, storage, or disposal of wastes classified by more than one waste code under Subpart D, or from a mixture of wastes classified under Subparts C and D of this part. (Leachate resulting from the management of one or more of the following EPA Hazardous Wastes and no other hazardous wastes retains its hazardous waste code(s): F020, F021, F022, F023, F026, F027, and/or F028.)

EPA HAZARDOUS WASTE CODES
(Continued)

Code	Waste description

HAZARDOUS WASTE FROM SPECIFIC SOURCES

K001	Bottom sediment sludge from the treatment of wastewaters from wood preserving processes that use creosote and/or pentachlorophenol.
K002	Wastewater treatment sludge from the production of chrome yellow and orange pigments.
K003	Wastewater treatment sludge from the production of molybdate orange pigments.
K004	Wastewater treatment sludge from the production of zinc yellow pigments.
K005	Wastewater treatment sludge from the production of chrome green pigments.
K006	Wastewater treatment sludge from the production of chrome oxide green pigments (anhydrous and hydrated).
K007	Wastewater treatment sludge from the production of iron blue pigments.
K008	Oven residue from the production of chrome oxide green pigments.
K009	Distillation bottoms from the production of acetaldehyde from ethylene.
K010	Distillation side cuts from the production of acetaldehyde from ethylene.
K011	Bottom stream from the wastewater stripper in the production of acrylonitrile.
K013	Bottom stream from the acetonitrile column in the production of acrylonitrile.
K014	Bottoms from the acetonitrile purification column in the production of acrylonitrile.
K015	Still bottoms from the distillation of benzyl chloride.
K016	Heavy ends or distillation residues from the production of carbon tetrachloride.
K017	Heavy ends (still bottoms) from the purification column in the production of epichlorohydrin.
K018	Heavy ends from the fractionation column in ethyl chloride production.
K019	Heavy ends from the distillation of ethylene dichloride in ethylene dichloride production.
K020	Heavy ends from the distillation of vinyl chloride in vinyl chloride monomer production.
K021	Aqueous spent antimony catalyst waste from fluoromethanes production.
K022	Distillation bottom tars from the production of phenol/acetone from cumene.
K023	Distillation light ends from the production of phthalic anhydride from naphthalene.
K024	Distillation bottoms from the production of phthalic anhydride from naphthalene.
K025	Distillation bottoms from the production of nitrobenzene by the nitration of benzene.
K026	Stripping still tails from the production of methyl ethyl pyridines.
K027	Centrifuge and distillation residues from toluene diisocyanate production.
K028	Spent catalyst from the hydrochlorinator reactor in the production of 1,1,1-trichloroethane.
K029	Waste from the product steam stripper in the production of 1,1,1-trichloroethane.
K030	Column bottoms or heavy ends from the combined production of trichloroethylene and perchloroethylene.
K031	By-product salts generated in the production of MSMA and cacodylic acid.
K032	Wastewater treatment sludge from the production of chlordane.
K033	Wastewater and scrub water from the chlorination of cyclopentadiene in the production of chlordane.

EPA HAZARDOUS WASTE CODES
(Continued)

Code	Waste description
K034	Filter solids from the filtration of hexachlorocyclopentadiene in the production of chlordane.
K035	Wastewater treatment sludges generated in the production of creosote.
K036	Still bottoms from toluene reclamation distillation in the production of disulfoton.
K037	Wastewater treatment sludges from the production of disulfoton.
K038	Wastewater from the washing and stripping of phorate production.
K039	Filter cake from the filtration of diethylphosphorodithioic acid in the production of phorate.
K040	Wastewater treatment sludge from the production of phorate.
K041	Wastewater treatment sludge from the production of toxaphene.
K042	Heavy ends or distillation residues from the distillation of tetrachlorobenzene in the production of 2,4,5-T.
K043	2,6-dichlorophenol waste from the production of 2,4-D.
K044	Wastewater treatment sludges from the manufacturing and processing of explosives.
K045	Spent carbon from the treatment of wastewater containing explosives.
K046	Wastewater treatment sludges from the manufacturing, formulation, and loading of lead-based initiating compounds.
K047	Pink/red water from TNT operations.
K048	Dissolved air flotation (DAF) float from the petroleum refining industry.
K049	Slop oil emulsion solids from the petroleum refining industry.
K050	Heat exchanger bundle cleaning sludge from the petroleum refining industry.
K051	API separator sludge from the petroleum refining industry.
K052	Tank bottoms (leaded) from the petroleum refining industry.
K060	Ammonia still lime sludge from coking operations.
K061	Emission control dust/sludge from the primary production of steel in electric furnaces.
K062	Spent pickle liquor generated by steel finishing operations of facilities within the iron and steel industry (SIC Codes 331 and 332).
K064	Acid plant blowdown slurry/sludge resulting from the thickening of blowdown slurry from primary copper production.
K065	Surface impoundment solids contained in and dredged from surface impoundments at primary lead smelting facilities.
K066	Sludge from treatment of process wastewater and/or acid plant blowdown from primary zinc production.
K069	Emission control dust/sludge from secondary lead smelting.
K071	Brine purification muds from the mercury cell process in chlorine production, in which separately prepurified brine is not used.
K073	Chlorinated hydrocarbon waste from the purification step of the diaphragm cell process using graphite anodes in chlorine production.
K083	Distillation bottoms from aniline production.
K084	Wastewater treatment sludges generated during the production of veterinary pharmaceuticals from arsenic or organo-arsenic compounds.
K085	Distillation or fractionation column bottoms from the production of chlorobenzenes.

EPA HAZARDOUS WASTE CODES
(Continued)

Code	Waste description
K086	Solvent washes and sludges, caustic washes and sludges, or water washes and sludges from cleaning tubs and equipment used in the formulation of ink from pigments, driers, soaps, and stabilizers containing chromium and lead.
K087	Decanter tank tar sludge from coking operations.
K088	Spent potliners from primary aluminum reduction.
K090	Emission control dust or sludge from ferrochromiumsilicon production.
K091	Emission control dust or sludge from ferrochromium production.
K093	Distillation light ends from the production of phthalic anhydride from ortho-xylene.
K094	Distillation bottoms from the production of phthalic anhydride from ortho-xylene.
K095	Distillation bottoms from the production of 1,1,1-trichloroethane.
K096	Heavy ends from the heavy ends column from the production of 1,1,1-trichloroethane.
K097	Vacuum stripper discharge from the chlordane chlorinator in the production of chlordane.
K098	Untreated process wastewater from the production of toxaphene.
K099	Untreated wastewater from the production of 2,4-D.
K100	Waste leaching solution from acid leaching of emission control dust/sludge from secondary lead smelting.
K101	Distillation tar residues from the distillation of aniline-based compounds in the production of veterinary pharmaceuticals from arsenic or organo-arsenic compounds.
K102	Residue from the use of activated carbon for decolorization in the production of veterinary pharmaceuticals from arsenic or organo-arsenic compounds.
K103	Process residues from aniline extraction from the production of aniline.
K104	Combined wastewater streams generated from nitrobenzene/aniline production.
K105	Separated aqueous stream from the reactor product washing step in the production of chlorobenzenes.
K106	Wastewater treatment sludge from the mercury cell process in chlorine production.
K107	Column bottoms from product separation from the production of 1,1-dimethylhydrazine (UDMH) from carboxylic acid hydrazines.
K108	Condensed column overheads from product separation and condensed reactor vent gases from the production of 1,1-dimethylhydrazine (UDMH) from carboxylic acid hydrazides.
K109	Spent filter cartridges from product purification from the production of 1,1-dimethylhydrazine (UDMH) from carboxylic acid hydrazides.
K110	Condensed column overheads from intermediate separation from the production of 1,1-dimethylhydrazine (UDMH) from carboxylic acid hydrazides.
K111	Product washwaters from the production of dinitrotoluene via nitration of toluene.
K112	Reaction by-product water from the drying column in the production of toluenediamine via hydrogenation of dinitrotoluene.
K113	Condensed liquid light ends from purification of toluenediamine in production of toluenediamine via hydrogenation of dinitrotoluene.
K114	Vicinals from the purification of toluenediamine in production of toluenediamine via hydrogenation of dinitrotoluene.

EPA HAZARDOUS WASTE CODES
(Continued)

Code	Waste description
K115	Heavy ends from purification of toluenediamine in the production of toluenediamine via hydrogenation of dinitrotoluene.
K116	Organic condensate from the solvent recovery column in the production of toluene diisocyanate via phosgenation of toluenediamine.
K117	Wastewater from the reactor vent gas scrubber in the production of ethylene dibromide via bromination of ethene.
K118	Spent adsorbent solids from purification of ethylene dibromide in the production of ethylene dibromide via bromination of ethene.
K123	Process wastewater (including supernates, filtrates, and washwaters) from the production of ethylenebisdithiocarbamic acid and its salt.
K124	Reactor vent scrubber water from the production of ethylenebisdithiocarbamic acid and its salts.
K125	Filtration, evaporation, and centrifugation solids from the production of ethylenebisdithiocarbamic acid and its salts.
K126	Baghouse dust and floor sweepings in milling and packaging operations from production or formulation of ethylenebisdithiocarbamic acid and its salts.
K131	Wastewater from the reactor and spent sulfuric acid from the acid dryer from the production of methyl bromide.
K132	Spent absorbent and wastewater separator solids from the production of methyl bromide.
K136	Still bottoms from the purification of ethylene dibromide in the production of ethylene dibromide via bromination of ethene.

DISCARDED COMMERCIAL CHEMICAL PRODUCTS, OFF-SPECIFICATION SPECIES, CONTAINER RESIDUALS, AND SPILL RESIDUES THEREOF--ACUTE HAZARDOUS WASTE

(AN ALPHABETIZED LISTING CAN BE FOUND AT 40 CFR 261.33.)

P001	2H-1-Benzopyran-2-one, 4-hydroxy-3-(3-oxo-1-phenylbutyl)-, & salts, when present at concentrations greater than 0.3%
P001	Warfarin, & salts, when present at concentrations greater than 0.3%
P002	1-Acetyl-2-thiourea
P002	Acetamide, N-(aminothioxomethyl)-
P003	2-Propenal
P003	Acrolein
P004	1,4,5,8-Dimethanonaphthalene, 1,2,3,4,10,10-hexa-chloro-1,4,4a,5,8,8a,-hexahydro-, (1alpha, 4alpha, 4abeta, 5alpha, 8alpha, 8abeta)-
P004	Aldrin
P005	2-Propen-1-ol
P005	Allyl alcohol
P006	Aluminum phosphide (R,T)
P007	3(2H)-Isoxazolone, 5-(aminomethyl)-
P007	5-(Aminomethyl)-3-isoxazolol
P008	4-Aminopyridine
P008	4-Pyridinamine
P009	Ammonium picrate (R)
P009	Phenol, 2,4,6-trinitro-, ammonium salt (R)
P010	Arsenic acid H_3AsO_4
P011	Arsenic oxide As_2O_5
P011	Arsenic pentoxide
P012	Arsenic oxide As_2O_3
P012	Arsenic trioxide
P013	Barium cyanide

EPA HAZARDOUS WASTE CODES
(Continued)

Code	Waste description
P014	Benzenethiol
P014	Thiophenol
P015	Beryllium
P016	Dichloromethyl ether
P016	Methane, oxybis[chloro-
P017	2-Propanone, 1-bromo-
P017	Bromoacetone
P018	Brucine
P018	Strychnidin-10-one, 2,3-dimethoxy-
P020	Dinoseb
P020	Phenol, 2-(1-methylpropyl)-4,6-dinitro-
P021	Calcium cyanide
P021	Calcium cyanide $Ca(CN)_2$
P022	Carbon disulfide
P023	Acetaldehyde, chloro-
P023	Chloroacetaldehyde
P024	Benzenamine, 4-chloro-
P024	p-Chloroaniline
P026	1-(o-Chlorophenyl)thiourea
P026	Thiourea, (2-chlorophenyl)-
P027	3-Chloropropionitrile
P027	Propanenitrile, 3-chloro-
P028	Benzene, (chloromethyl)-
P028	Benzyl chloride
P029	Copper cyanide
P029	Copper cyanide Cu(CN)
P030	Cyanides (soluble cyanide salts), not otherwise specified
P031	Cyanogen
P031	Ethanedinitrile
P033	Cyanogen chloride
P033	Cyanogen chloride (CN)Cl
P034	2-Cyclohexyl-4,6-dinitrophenol
P034	Phenol, 2-cyclohexyl-4,6-dinitro-
P036	Arsonous dichloride, phenyl-
P036	Dichlorophenylarsine
P037	2,7:3,6-Dimethanonaphth[2,3-b]oxirene, 3,4,5,6,9,9-hexachloro-1a,2,2a,3,6,6a,7,7a-octahydro-, (1aalpha, 2beta, 2aalpha, 3beta, 6beta, 6aalpha, 7beta, 7aalpha)-
P037	Dieldrin
P038	Arsine, diethyl-
P038	Diethylarsine
P039	Disulfoton
P039	Phosphorodithioic acid, O,O-diethyl S-[2-(ethylthio)ethyl] ester
P040	O,O-Diethyl O-pyrazinyl phosphorothioate
P040	Phosphorothioic acid, O,O-diethyl O-pyrazinyl ester
P041	Diethyl-p-nitrophenyl phosphate
P041	Phosphoric acid, diethyl 4-nitrophenyl ester
P042	1,2-Benzenediol, 4-[1-hydroxy-2-(methylamino)ethyl]-, (R)-
P042	Epinephrine
P043	Diisopropylfluorophosphate (DFP)
P043	Phosphorofluoridic acid, bis(1-methylethyl) ester
P044	Dimethoate
P044	Phosphorodithioic acid, O,O-dimethyl S-[2-(methylamino)-2-oxoethyl] ester
P045	2-Butanone, 3,3-dimethyl-1-(methylthio)-, O-[methylamino)carbonyl] oxime
P045	Thiofanox
P046	alpha,alpha-Dimethylphenethylamine
P046	Benzeneethanamine, alpha, alpha-dimethyl-
P047	4,6-Dinitro-o-cresol, & salts
P047	Phenol, 2-methyl-4,6-dinitro-, & salts
P048	2,4-Dinitrophenol
P048	Phenol, 2,4-dinitro-
P049	Dithiobiuret

EPA HAZARDOUS WASTE CODES
(Continued)

Code	Waste description
P049	Thioimidodicarbonic diamide $[(H_2N)C(S)]_2NH$
P050	6,9-Methano-2,4,3-benzodioxathiepin,6,7,8,9,10,10-hexachloro-1,5,5a,6,9,9a-hexahydro-,3-oxide
P050	Endosulfan
P051	2,7:3,6-Dimethanonaphth[2,3-b]oxirene, 3,4,5,6,9,9-hexachloro-1a,2,2a,3,6,6a,7,7a-octahydro-, (1aalpha, 2beta, 2abeta, 3alpha, 6alpha, 6abeta, 7beta, 7aalpha)- & metabolites
P051	Endrin
P051	Endrin, & metabolites
P054	Aziridine
P054	Ethyleneimine
P056	Fluorine
P057	Acetamide, 2-fluoro-
P057	Fluoroacetamide
P058	Acetic acid, fluoro-, sodium salt
P058	Fluoroacetic acid, sodium salt
P059	4,7-Methano-1H-indene, 1,4,5,6,7,8,8-heptachloro-3a,4,7,7a-tetrahydro-
P059	Heptachlor
P060	1,4,5,8-Dimethanonaphthalene, 1,2,3,4,10,10-hexa-chloro-1,4,4a,5,8,8a,-hexahydro-, (1alpha, 4alpha, 4abeta, 5beta, 8beta, 8abeta)-
P060	Isodrin
P062	Hexaethyl tetraphosphate
P062	Tetraphosphoric acid, hexaethyl ester
P063	Hydrocyanic acid
P063	Hydrogen cyanide
P064	Methane, isocyanato-
P064	Methyl isocyanate
P065	Fulminic acid, mercury(2+) salt (R,T)
P065	Mercury fulminate (R,T)
P066	Ethanimidothioic acid, N-[[(methylamino)carbonyl]oxy]-, methyl ester
P066	Methomyl
P067	1,2-Propylenimine
P067	Aziridine, 2-methyl-
P068	Hydrazine, methyl-
P068	Methyl hydrazine
P069	2-Methyllactonitrile
P069	Propanenitrile, 2-hydroxy-2-methyl-
P070	Aldicarb
P070	Propanal, 2-methyl-2-(methylthio)-, O-[(methylamino)carbonyl]oxime
P071	Methyl parathion
P071	Phosphorothioic acid, O,O,-dimethyl O-(4-nitrophenyl) ester
P072	alpha-Naphthylthiourea
P072	Thiourea, 1-naphthalenyl-
P073	Nickel carbonyl
P073	Nickel carbonyl $Ni(CO)_4$, (T-4)-
P074	Nickel cyanide
P074	Nickel cyanide $Ni(CN)_2$
P075	Nicotine, & salts
P075	Pyridine, 3-(1-methyl-2-pyrrolidinyl)-,(S)-, & salts
P076	Nitric oxide
P076	Nitrogen oxide NO
P077	Benzenamine, 4-nitro-
P077	p-Nitroaniline
P078	Nitrogen dioxide
P078	Nitrogen oxide NO_2
P081	1,2,3-Propanetriol, trinitrate (R)
P081	Nitroglycerine (R)
P082	Methanimine, N-methyl-N-nitroso-
P082	N-Nitrosodimethylamine

EPA HAZARDOUS WASTE CODES
(Continued)

Code	Waste description
P084	N-Nitrosomethylvinylamine
P084	Vinylamine, N-methyl-N-nitroso-
P085	Diphosphoramide, octamethyl-
P085	Octamethylpyrophosphoramide
P087	Osmium oxide OsO_4, (T-4)-
P087	Osmium tetroxide
P088	7-Oxabicyclo[2.2.1]heptane-2,3-dicarboxylic acid
P088	Endothall
P089	Parathion
P089	Phosphorothioic acid, O,O-diethyl-O-(4-nitrophenyl) ester
P092	Mercury, (acetato-O)phenyl-
P092	Phenylmercury acetate
P093	Phenylthiourea
P093	Thiourea, phenyl-
P094	Phorate
P094	Phosphorodithioic acid, O,O-diethyl S-[(ethylthio)methyl] ester
P095	Carbonic dichloride
P095	Phosgene
P096	Hydrogen phosphide
P096	Phosphine
P097	Famphur
P097	Phosphorothioic acid O-[4-[(dimethylamino)sulfonyl]phenyl] O,O-dimethyl ester
P098	Potassium cyanide
P098	Potassium cyanide K(CN)
P099	Argentate (1-), bis(cyano-C)-, potassium
P099	Potassium silver cyanide
P101	Ethyl cyanide
P101	Propanenitrile
P102	2-Propyn-1-ol
P102	Propargyl alcohol
P103	Selenourea
P104	Silver cyanide
P104	Silver cyanide Ag(CN)
P105	Sodium azide
P106	Sodium cyanide
P106	Sodium cyanide Na(CN)
P107	Strontium sulfide SrS
P108	Strychnidin-10-one, & salts
P108	Strychnine, & salts
P109	Tetraethyldithiopyrophosphate
P109	Thiodiphosphoric acid, tetraethyl ester
P110	Plumbane, tetraethyl-
P110	Tetraethyl lead
P111	Diphosphoric acid, tetraethyl ester
P111	Tetraethyl pyrophosphate
P112	Methane, tetranitro- (R)
P112	Tetranitromethane (R)
P113	Thallic oxide
P113	Thallium oxide Tl_2O_3
P114	Selenious acid, dithallium (1+) salt
P114	Thallium(I) selenite
P115	Sulfuric acid, dithallium (1+) salt
P115	Thallium(I) sulfate
P116	Hydrazinecarbothioamide
P116	Thiosemicarbazide
P118	Methanethiol, trichloro-
P118	Trichloromethanethiol
P119	Ammonium vanadate
P119	Vanadic acid, ammonium salt
P120	Vanadium oxide V_2O_5
P120	Vanadium pentoxide
P121	Zinc cyanide
P121	Zinc cyanide $Zn(CN)_2$
P122	Zinc phosphide Zn_3P_2, when present at concentrations greater than 10% (R,T)
P123	Toxaphene

EPA HAZARDOUS WASTE CODES
(Continued)

Code	Waste description

DISCARDED COMMERCIAL CHEMICAL PRODUCTS, OFF-SPECIFICATION SPECIES, CONTAINER RESIDUES, AND SPILL RESIDUES THEREOF–TOXIC WASTES

(AN ALPHABETIZED LISTING CAN BE FOUND AT 40 CFR 261.33.)

See F027	2,3,4,6-Tetrachlorophenol 2,4,5-T 2,4,5-Trichlorophenol 2,4,6-Trichlorophenol Acetic acid, (2,4,5-trichlorophenoxy)- Pentachlorophenol Phenol, 2,3,4,6-tetrachloro- Phenol, 2,4,5-trichloro- Phenol, 2,4,6-trichloro- Phenol, pentachloro- Propanoic acid, 2-(2,4,5-trichlorophenoxy)- Silvex (2,4,5-TP)
U001	Acetaldehyde (I)
U001	Ethanal (I)
U002	2-Propanone (I)
U002	Acetone (I)
U003	Acetonitrile (I,T)
U004	Acetophenone
U004	Ethanone, 1-phenyl-
U005	2-Acetylaminofluorene
U005	Acetamide, N-9H-fluoren-2-yl
U006	Acetyl chloride (C,R,T)
U007	2-Propenamide
U007	Acrylamide
U008	2-Propenoic acid (I)
U008	Acrylic acid (I)
U009	2-Propenenitrile
U009	Acrylonitrile
U010	Azirino [2',3':3,4]pyrrolo[1,2-a]indole-4,7-dione, 6-amino-8-[[(aminocarbonyl)oxy]methyl]-1,1a,2,8,8a,8b-hexahydro-8a-methoxy-5-methyl-, [1aS-(1aalpha, 8beta, 8aalpha, 8balpha)]-
U010	Mitomycin C
U011	1H-1,2,4-Triazol-3-amine
U011	Amitrole
U012	Aniline (I,T)
U012	Benzenamine (I,T)
U014	Auramine
U014	Benzenamine, 4,4'-carbonimidoylbis[N,N-dimethyl-
U015	Azaserine
U015	L-Serine, diazoacetate (ester)
U016	Benz[c]acridine
U017	Benzal chloride
U017	Benzene, (dichloromethyl)-
U018	Benz[a]anthracene
U019	Benzene (I,T)
U020	Benzenesulfonic acid chloride (C,R)
U020	Benzenesulfonyl chloride (C,R)
U021	[1,1'-Biphenyl]-4,4'-diamine
U021	Benzidine
U022	Benzo[a]pyrene
U023	Benzene, (trichloromethyl)-
U023	Benzotrichloride (C,R,T)
U024	Dichloromethoxy ethane
U024	Ethane, 1,1'-[methylenebis(oxy)]bis[2-chloro-
U025	Dichloroethyl ether
U025	Ethane, 1,1'-oxybis[2-chloro-
U026	Chlornaphazin
U026	Naphthalenamine, N,N'-bis(2-chloroethyl)-

EPA HAZARDOUS WASTE CODES
(Continued)

Code	Waste description
U027	Dichloroisopropyl ether
U027	Propane, 2,2'-oxybis[2-chloro-
U028	1,2-Benzenedicarboxylic acid, bis(2-ethylhexyl) ester
U028	Diethylhexyl phthalate
U029	Methane, bromo-
U029	Methyl bromide
U030	4-Bromophenyl phenyl ether
U030	Benzene, 1-bromo-4-phenoxy-
U031	1-Butanol (I)
U031	n-Butyl alcohol (I)
U032	Calcium chromate
U032	Chromic acid H_2CrO_4, calcium salt
U033	Carbon oxyfluoride (R,T)
U033	Carbonic difluoride
U034	Acetaldehyde, trichloro-
U034	Chloral
U035	Benzenebutanoic acid, 4-[bis(2-chloroethyl)amino]-
U035	Chlorambucil
U036	4,7-Methano-1H-indene, 1,2,4,5,6,7,8,8-octachloro-2,3,3a,4,7,7a-hexahydro-
U036	Chlordane, alpha & gamma isomers
U037	Benzene, chloro-
U037	Chlorobenzene
U038	Benzeneacetic acid, 4-chloro-alpha-(4-chlorophenyl)-alpha-hydroxy-, ethyl ester
U038	Chlorobenzilate
U039	p-Chloro-m-cresol
U039	Phenol, 4-chloro-3-methyl-
U041	Epichlorohydrin
U041	Oxirane, (chloromethyl)-
U042	2-Chloroethyl vinyl ether
U042	Ethene, (2-chloroethoxy)-
U043	Ethene, chloro-
U043	Vinyl chloride
U044	Chloroform
U044	Methane, trichloro-
U045	Methane, chloro- (I,T)
U045	Methyl chloride (I,T)
U046	Chloromethyl methyl ether
U046	Methane, chloromethoxy-
U047	beta-Chloronaphthalene
U047	Naphthalene, 2-chloro-
U048	o-Chlorophenol
U048	Phenol, 2-chloro-
U049	4-Chloro-o-toluidine, hydrochloride
U049	Benzenamine, 4-chloro-2-methyl-, hydrochloride
U050	Chrysene
U051	Creosote
U052	Cresol (Cresylic acid)
U052	Phenol, methyl-
U053	2-Butenal
U053	Crotonaldehyde
U055	Benzene, (1-methylethyl)- (I)
U055	Cumene (I)
U056	Benzene, hexahydro- (I)
U056	Cyclohexane (I)
U057	Cyclohexanone (I)
U058	2H-1,3,2-Oxazaphosphorin-2-amine, N,N-bis(2-chloroethyl)tetrahydro-, 2-oxide
U058	Cyclophosphamide
U059	5,12-Naphthacenedione, 8-acetyl-10-[(3-amino-2,3,6-trideoxy)-alpha-L-lyxo-hexopyranosyl)oxy]-7,8,9,10-tetrahydro-6,8,11-trihydroxy-1-methoxy-, (8S-cis)-
U059	Daunomycin
U060	Benzene, 1,1'-(2,2-dichloroethylidene)bis[4-chloro-
U060	DDD

EPA HAZARDOUS WASTE CODES
(Continued)

Code	Waste description
U061	Benzene, 1,1'-(2,2,2-trichloroethylidene)bis[4-chloro-
U061	DDT
U062	Carbamothioic acid, bis(1-methylethyl)-, S-(2,3-dichloro-2-propenyl) ester
U062	Diallate
U063	Dibenz[a,h]anthracene
U064	Benzo[rst]pentaphene
U064	Dibenzo[a,i]pyrene
U066	1,2-Dibromo-3-chloropropane
U066	Propane, 1,2-dibromo-3-chloro-
U067	Ethane, 1,2-dibromo-
U067	Ethylene dibromide
U068	Methane, dibromo-
U068	Methylene bromide
U069	1,2-Benzenedicarboxylic acid, dibutyl ester
U069	Dibutyl phthalate
U070	Benzene, 1,2-dichloro-
U070	o-Dichlorobenzene
U071	Benzene, 1,3-dichloro-
U071	m-Dichlorobenzene
U072	Benzene, 1,4-dichloro-
U072	p-Dichlorobenzene
U073	[1,1'-Biphenyl]-4,4'-diamine, 3,3'-dichloro-
U073	3,3'-Dichlorobenzidine
U074	1,4-Dichloro-2-butene (I,T)
U074	2-Butene, 1,4-dichloro- (I,T)
U075	Dichlorodifluoromethane
U075	Methane, dichlorodifluoro-
U076	Ethane, 1,1-dichloro-
U076	Ethylidene dichloride
U077	Ethane, 1,2-dichloro-
U077	Ethylene dichloride
U078	1,1-Dichloroethylene
U078	Ethene, 1,1-dichloro-
U079	1,2-Dichloroethylene
U079	Ethene, 1,2-dichloro-,(E)-
U080	Methane, dichloro-
U080	Methylene chloride
U081	2,4-Dichlorophenol
U081	Phenol, 2,4-dichloro-
U082	2,6-Dichlorophenol
U082	Phenol, 2,6-dichloro-
U083	Propane, 1,2-dichloro-
U083	Propylene dichloride
U084	1,3-Dichloropropene
U084	1-Propene, 1,3-dichloro-
U085	1,2:3,4-Diepoxybutane (I,T)
U085	2,2'-Bioxirane
U086	Hydrazine, 1,2-diethyl-
U086	N,N'-Diethylhydrazine
U087	O,O-Diethyl S-methyl dithiophosphate
U087	Phosphorodithioic acid, O,O-diethyl S-methyl ester
U088	1,2-Benzenedicarboxylic acid, diethyl ester
U088	Diethyl phthalate
U089	Diethylstilbesterol
U089	Phenol, 4,4'-(1,2-diethyl-1,2-ethenediyl)bis, (E)-
U090	1,3-Benzodioxole, 5-propyl-
U090	Dihydrosafrole
U091	[1,1'-Biphenyl]-4,4'-diamine, 3,3'-dimethoxy-
U091	3,3'-Dimethoxybenzidine
U092	Dimethylamine (I)
U092	Methanamine, N-methyl- (I)
U093	Benzenamine, N,N-dimethyl-4-(phenylazo)-
U093	p-Dimethylaminoazobenzene
U094	7,12-Dimethylbenz[a]anthracene

Code	Waste description
U094	Benz[a]anthracene, 7,12-dimethyl-
U095	[1,1'-Biphenyl]-4,4'-diamine, 3,3'-dimethyl-
U095	3,3'-Dimethylbenzidine
U096	alpha,alpha-Dimethylbenzylhydroperoxide (R)
U096	Hydroperoxide, 1-methyl-1-phenylethyl- (R)
U097	Carbamic chloride, dimethyl-
U097	Dimethylcarbamoyl chloride
U098	1,1-Dimethylhydrazine
U098	Hydrazine, 1,1-dimethyl-
U099	1,2-Dimethylhydrazine
U099	Hydrazine, 1,2-dimethyl-
U101	2,4-Dimethylphenol
U101	Phenol, 2,4-dimethyl-
U102	1,2-Benzenedicarboxylic acid, dimethyl ester
U102	Dimethyl phthalate
U103	Dimethyl sulfate
U103	Sulfuric acid, dimethyl ester
U105	2,4-Dinitrotoluene
U105	Benzene, 1-methyl-2,4-dinitro-
U106	2,6-Dinitrotoluene
U106	Benzene, 2-methyl-1,3-dinitro-
U107	1,2-Benzenedicarboxylic acid, dioctyl ester
U107	Di-n-octyl phthalate
U108	1,4-Diethyleneoxide
U108	1,4-Dioxane
U109	1,2-Diphenylhydrazine
U109	Hydrazine, 1,2-diphenyl-
U110	1-Propanimine, N-propyl-(I)
U110	Dipropylamine (I)
U111	1-Propanamine, N-nitroso-N-propyl-
U111	Di-n-propylnitrosamine
U112	Acetic acid ethyl ester (I)
U112	Ethyl acetate (I)
U113	2-Propenoic acid, ethyl ester (I)
U113	Ethyl acrylate (I)
U114	Carbamodithioic acid, 1,2-ethanediylbis-, salts & esters
U114	Ethylenebisdithiocarbamic acid, salts & esters
U115	Ethylene oxide (I,T)
U115	Oxirane (I,T)
U116	2-Imidazolidinethione
U116	Ethylenethiourea
U117	Ethane, 1,1'-oxybis-(I)
U117	Ethyl ether (I)
U118	2-Propenoic acid, 2-methyl-, ethyl ester
U118	Ethyl methacrylate
U119	Ethyl methanesulfonate
U119	Methanesulfonic acid, ethyl ester
U120	Fluoranthene
U121	Methane, trichlorofluoro-
U121	Trichloromonofluoromethane
U122	Formaldehyde
U123	Formic acid (C,T)
U124	Furan (I)
U124	Furfuran (I)
U125	2-Furancarboxaldehyde (I)
U125	Furfural (I)
U126	Glycidylaldehyde
U126	Oxiranecarboxyaldehyde
U127	Benzene, hexachloro-
U127	Hexachlorobenzene
U128	1,3-Butadiene, 1,1,2,3,4,4-hexachloro-
U128	Hexachlorobutadiene
U129	Cyclohexane, 1,2,3,4,5,6-hexachloro-, (1alpha, 2alpha, 3beta, 4alpha, 5alpha, 6beta)-

EPA HAZARDOUS WASTE CODES
(Continued)

Code	Waste description
U129	Lindane
U130	1,3-Cyclopentadiene, 1,2,3,4,5,5-hexachloro-
U130	Hexachlorocyclopentadiene
U131	Ethane, hexachloro-
U131	Hexachloroethane
U132	Hexachlorophene
U132	Phenol, 2,2'-methylenebis[3,4,6-trichloro-
U133	Hydrazine (R,T)
U134	Hydrofluoric acid (C,T)
U134	Hydrogen fluoride (C,T)
U135	Hydrogen sulfide
U135	Hydrogen sulfide H_2S
U136	Arsinic acid, dimethyl-
U136	Cacodylic acid
U137	Indeno[1,2,3-cd]pyrene
U138	Methane, iodo-
U138	Methyl iodide
U140	1-Propanol, 2-methyl- (I,T)
U140	Isobutyl alcohol (I,T)
U141	1,3-Benzodioxole, 5-(1-propenyl)-
U141	Isosafrole
U142	1,3,4-Metheno-2H-cyclobuta[cd]pentalen-2-one, 1,1a,3,3a,4,5,5,5a,5b,6-decachlorooctahydro-
U142	Kepone
U143	2-Butenoic acid, 2-methyl-, 7-[[2,3-dihydroxy-2-(1-methoxyethyl)-3-methyl-1-oxobutoxy]methyl]-2,3,5,7a-tetrahydro-1H-pyrrolizin-1-yl ester, [1S-[1alpha(Z), 7(2S*,3R*), 7aalpha]]-
U143	Lasiocarpine
U144	Acetic acid, lead(2+) salt
U144	Lead acetate
U145	Lead phosphate
U145	Phosphoric acid, lead(2+) salt (2:3)
U146	Lead subacetate
U146	Lead, bis(acetato-O)tetrahydroxytri-
U147	2,5-Furandione
U147	Maleic anhydride
U148	3,6-Pyridazinedione, 1,2-dihydro-
U148	Maleic hydrazide
U149	Malononitrile
U149	Propanedinitrile
U150	L-Phenylalanine, 4-[bis(2-chloroethyl)amino]-
U150	Melphalan
U151	Mercury
U152	2-Propenenitrile, 2-methyl- (I,T)
U152	Methacrylonitrile (I,T)
U153	Methanethiol (I,T)
U153	Thiomethanol (I,T)
U154	Methanol (I)
U154	Methyl alcohol (I)
U155	1,2-Ethanediamine, N,N-dimethyl-N'-2-pyridinyl-N'-(2-thienylmethyl)-
U155	Methapyrilene
U156	Carbonochloridic acid, methyl ester, (I,T)
U156	Methyl chlorocarbonate (I,T)
U157	3-Methylcholanthrene
U157	Benz[j]aceanthrylene, 1,2-dihydro-3-methyl-
U158	4,4'-Methylenebis(2-chloroaniline)
U158	Benzenamine, 4,4'-methylenebis[2-chloro-
U159	2-Butanone (I,T)
U159	Methyl ethyl ketone (MEK) (I,T)
U160	2-Butanone, peroxide (R,T)
U160	Methyl ethyl ketone peroxide (R,T)
U161	4-Methyl-2-pentanone (I)
U161	Methyl isobutyl ketone (I)
U161	Pentanol, 4-methyl-

EPA HAZARDOUS WASTE CODES
(Continued)

Code	Waste description
U162	2-Propenoic acid, 2-methyl-, methyl ester (I,T)
U162	Methyl methacrylate (I,T)
U163	Guanidine, N-methyl-N'-nitro-N-nitroso-
U163	MNNG
U164	4(1H)-Pyrimidinone, 2,3-dihydro-6-methyl-2-thioxo-
U164	Methylthiouracil
U165	Naphthalene
U166	1,4-Naphthalenedione
U166	1,4-Naphthoquinone
U167	1-Napthalenamine
U167	alpha-Naphthylamine
U168	2-Napthalenamine
U168	beta-Naphthylamine
U169	Benzene, nitro-
U169	Nitrobenzene (I,T)
U170	p-Nitrophenol
U170	Phenol, 4-nitro-
U171	2-Nitropropane (I,T)
U171	Propane, 2-nitro- (I,T)
U172	1-Butanamine, N-butyl-N-nitroso-
U172	N-Nitrosodi-n-butylamine
U173	Ethanol, 2,2'-(nitrosoimino)bis-
U173	N-Nitrosodiethanolamine
U174	Ethanamine, N-ethyl-N-nitroso-
U174	N-Nitrosodiethylamine
U176	N-Nitroso-N-ethylurea
U176	Urea, N-ethyl-N-nitroso-
U177	N-Nitroso-N-methylurea
U177	Urea, N-methyl-N-nitroso-
U178	Carbamic acid, methylnitroso-, ethyl ester
U178	N-Nitroso-N-methylurethane
U179	N-Nitrosopiperidine
U179	Piperidine, 1-nitroso-
U180	N-Nitrosopyrrolidine
U180	Pyrrolidine, 1-nitroso-
U181	5-Nitro-o-toluidine
U181	Benzenamine, 2-methyl-5-nitro
U182	1,3,5-Trioxane, 2,4,6-trimethyl-
U182	Paraldehyde
U183	Benzene, pentachloro-
U183	Pentachlorobenzene
U184	Ethane, pentachloro-
U184	Pentachloroethane
U185	Benzene, pentachloronitro-
U185	Pentachloronitrobenzene (PCNB)
U186	1,3-Pentadiene (I)
U186	1-Methylbutadiene (I)
U187	Acetamide, N-(4-ethoxyphenyl)-
U187	Phenacetin
U188	Phenol
U189	Phosphorus sulfide (R)
U189	Sulfur phosphide (R)
U190	1,3-Isobenzofurandione
U190	Phthalic anhydride
U191	2-Picoline
U191	Pyridine, 2-methyl-
U192	Benzamide, 3,5-dichloro-N-(1,1-dimethyl-2-propynyl)-
U192	Pronamide
U193	1,2-Oxathiolane, 2,2-dioxide
U193	1,3-Propane sultone
U194	1-Propanamine (I,T)
U194	n-Propylamine (I,T)
U196	Pyridine
U197	2,5-Cyclohexadiene-1,4-dione
U197	p-Benzoquinone
U200	Reserpine

EPA HAZARDOUS WASTE CODES
(Continued)

Code	Waste description
U200	Yohimban-16-carboxylic acid, 11,17-dimethoxy-18-[(3,4,5-trimethoxybenzoyl)oxy]-, methyl ester, (3beta, 16beta, 17alpha, 18beta, 20alpha)-
U201	1,3-Benzenediol
U201	Resorcinol
U202	1,2-Benzisothiazol-3(2H)-one, 1,1-dioxide, & salts
U202	Saccharin, & salts
U203	1,3-Benzodioxole, 5-(2-propenyl)-
U203	Safrole
U204	Selenious acid
U204	Selenium dioxide
U205	Selenium sulfide
U205	Selenium sulfide SeS_2 (R,T)
U206	D-Glucose, 2-deoxy-2-[[(methylnitrosoamino)-carbonyl]amino]-
U206	Glucopyranose, 2-deoxy-2-(3-methyl-3-nitrosoureido)-,D-
U206	Streptozotocin
U207	1,2,4,5-Tetrachlorobenzene
U207	Benzene, 1,2,4,5-tetrachloro-
U208	1,1,1,2-Tetrachloroethane
U208	Ethane, 1,1,1,2-tetrachloro-
U209	1,1,2,2-Tetrachloroethane
U209	Ethane, 1,1,2,2-tetrachloro-
U210	Ethene, tetrachloro-
U210	Tetrachloroethylene
U211	Carbon tetrachloride
U211	Methane, tetrachloro-
U213	Furan, tetrahydro-(I)
U213	Tetrahydrofuran (I)
U214	Acetic acid, thallium(1+) salt
U214	Thallium(I) acetate
U215	Carbonic acid, dithallium(1+) salt
U215	Thallium(I) carbonate
U216	Thallium chloride Tlcl
U216	Thallium(I) chloride
U217	Nitric acid, thallium(1+) salt
U217	Thallium(I) nitrate
U218	Ethanethioamide
U218	Thioacetamide
U219	Thiourea
U220	Benzene, methyl-
U220	Toluene
U221	Benzenediamine, ar-methyl-
U221	Toluenediamine
U222	Benzenamine, 2-methyl-, hydrochloride
U222	o-Toluidine hydrochloride
U223	Benzene, 1,3-diisocyanatomethyl- (R,T)
U223	Toluene diisocyanate (R,T)
U225	Bromoform
U225	Methane, tribromo-
U226	Ethane, 1,1,1-trichloro-
U226	Methyl chloroform
U227	1,1,2-Trichloroethane
U227	Ethane, 1,1,2-trichloro-
U228	Ethene, trichloro-
U228	Trichloroethylene
U234	1,3,5-Trinitrobenzene (R,T)
U234	Benzene, 1,3,5-trinitro-
U235	1-Propanol, 2,3-dibromo-, phosphate (3:1)
U235	Tris(2,3,-dibromopropyl) phosphate
U236	2,7-Naphthalenedisulfonic acid,3,3'-[(3,3'-dimethyl[1,1'-biphenyl]-4,4'-diyl)bis(azo)bis[5-amino-4-hydroxy]-, tetrasodium salt
U236	Trypan blue
U237	2,4-(1H,3H)-Pyrimidinedione, 5-[bis(2-chloroethyl)amino]-
U237	Uracil mustard

SOURCE CODES

Code	Waste source
CLEANING AND DEGREASING	
A01	Stripping
A02	Acid cleaning
A03	Caustic (Alkali) cleaning
A04	Flush rinsing
A05	Dip rinsing
A06	Spray rinsing
A07	Vapor degreasing
A08	Physical scraping and removal
A09	Clean out process equipment
A19	Other cleaning and degreasing
SURFACE PREPARATION AND FINISHING	
A21	Painting
A22	Electroplating
A23	Electroless plating
A24	Phosphating
A25	Heat treating
A26	Pickling
A27	Etching
A29	Other surface coating/preparation (Specify in Comments)
PROCESSES OTHER THAN SURFACE PREPARATION	
A31	Product rinsing
A32	Product filtering
A33	Product distillation
A34	Product solvent extraction
A35	By-product processing
A36	Spent catalyst removal
A37	Spent process liquids removal
A38	Tank sludge removal
A39	Slag removal
A40	Metal forming
A41	Plastics forming
A49	Other processes other than surface preparation (Specify in Comments)
PRODUCTION OR SERVICE DERIVED ONE-TIME AND INTERMITTENT PROCESSES	
A51	Leak collection
A53	Cleanup of spill residues
A54	Oil changes
A55	Filter/Battery replacement
A56	Discontinue use of process equipment
A57	Discarding off-spec material
A58	Discarding out-of-date products or chemicals
A59	Other production-derived one-time and intermittent processes
A60	Sludge removal
REMEDIATION DERIVED WASTE	
A61	Superfund Remedial Action
A62	Superfund Emergency Response
A63	RCRA Corrective Action at solid waste management unit
A64	RCRA closure of hazardous waste management unit
A65	Underground storage tank cleanup
A69	Other remediation
POLLUTION CONTROL OR WASTE TREATMENT PROCESSES	
A71	Filtering/screening
A72	Metals recovery
A73	Solvents recovery
A74	Incineration/Thermal treatment
A75	Wastewater treatment
A76	Sludge dewatering
A77	Stabilization
A78	Air pollution control devices
A79	Leachate collection
A89	Other pollution control or waste treatment
OTHER PROCESSES	
A91	Clothing and personal protective equipment
A92	Routine cleanup wastes (e.g., floor sweepings)
A93	Closure of management unit(s) or equipment other than by remediation specified in codes A61 - A69
A94	Laboratory wastes
A99	Other

Code	Waste description

LAB PACKS

LAB PACKS - Lab packs of mixed wastes, chemicals, lab wastes

B001	Lab packs of old chemicals only
B002	Lab packs of debris only
B003	Mixed lab packs
B004	Lab packs containing acute hazardous wastes
B009	Other lab packs (Specify in Comments)

LIQUIDS

INORGANIC LIQUIDS - Waste that is primarily inorganic and highly fluid (e.g., aqueous), with low suspended inorganic solids and low organic content

B101	Aqueous waste with low solvents
B102	Aqueous waste with low other toxic organics
B103	Spent acid with metals
B104	Spent acid without metals
B105	Acidic aqueous waste
B106	Caustic solution with metals but no cyanides
B107	Caustic solution with metals and cyanides
B108	Caustic solution with cyanides but no metals
B109	Spent caustic
B110	Caustic aqueous waste
B111	Aqueous waste with reactive sulfides
B112	Aqueous waste with other reactives (e.g., explosives)
B113	Other aqueous waste with high dissolved solids
B114	Other aqueous waste with low dissolved solids
B115	Scrubber water
B116	Leachate
B117	Waste liquid mercury
B119	Other inorganic liquids (Specify in Comments)

ORGANIC LIQUIDS - Waste that is primarily organic and is highly fluid, with low inorganic solids content and low-to-moderate water content

B201	Concentrated solvent-water solution
B202	Halogenated (e.g., chlorinated) solvent
B203	Non-halogenated solvent
B204	Halogenated/non-halogenated solvent mixture
B205	Oil-water emulsion or mixture
B206	Waste oil
B207	Concentrated aqueous solution of other organics
B208	Concentrated phenolics
B209	Organic paint, ink, lacquer, or varnish
B210	Adhesives or epoxies
B211	Paint thinner or petroleum distillates
B212	Reactive or polymerizable organic liquid
B219	Other organic liquids (Specify in Comments)

SOLIDS

INORGANIC SOLIDS - Waste that is primarily inorganic and solid, with low organic content and low-to-moderate water content; not pumpable

B301	Soil contaminated with organics
B302	Soil contaminated with inorganics only
B303	Ash, slag, or other residue from incineration of wastes
B304	Other "dry" ash, slag, or thermal residue
B305	"Dry" lime or metal hydroxide solids chemically "fixed"

Code	Waste description
B306	"Dry" lime or metal hydroxide solids not "fixed"
B307	Metal scale, filings, or scrap
B308	Empty or crushed metal drums or containers
B309	Batteries or battery parts, casings, cores
B310	Spent solid filters or adsorbents
B311	Asbestos solids and debris
B312	Metal-cyanide salts/chemicals
B313	Reactive cyanide salts/chemicals
B314	Reactive sulfide salts/chemicals
B315	Other reactive salts/chemicals
B316	Other metal salts/chemicals
B319	Other waste inorganic solids (Specify in Comments)

ORGANIC SOLIDS - Waste that is primarily organic and solid, with low-to-moderate inorganic content and water content; not pumpable

B401	Halogenated pesticide solid
B402	Non-halogenated pesticide solid
B403	Solid resins or polymerized organics
B404	Spent carbon
B405	Reactive organic solid
B406	Empty fiber or plastic containers
B407	Other halogenated organic solids (Specify in Comments)
B409	Other non-halogenated organic solids (Specify in Comments)

SLUDGES

INORGANIC SLUDGES - Waste that is primarily inorganic, with moderate-to-high water content and low organic content, and pumpable

B501	Lime sludge without metals
B502	Lime sludge with metals/metal hydroxide sludge
B503	Wastewater treatment sludge with toxic organics
B504	Other wastewater treatment sludge
B505	Untreated plating sludge without cyanides
B506	Untreated plating sludge with cyanides
B507	Other sludge with cyanides
B508	Sludge with reactive sulfides
B509	Sludge with other reactives
B510	Degreasing sludge with metal scale or filings
B511	Air pollution control device sludge (e.g., fly ash, wet scrubber sludge)
B512	Sediment or lagoon dragout contaminated with organics
B513	Sediment or lagoon dragout contaminated with inorganics only
B514	Drilling mud
B515	Asbestos slurry or sludge
B516	Chloride or other brine sludge
B519	Other inorganic sludges (Specify in Comments)

ORGANIC SLUDGES - Waste that is primarily organic with low-to-moderate inorganic solids content and water content, and pumpable

B601	Still bottoms of halogenated (e.g., chlorinated) solvents or other organic liquids
B602	Still bottoms of non-halogenated solvents or other organic liquids
B603	Oily sludge
B604	Organic paint or ink sludge
B605	Reactive or polymerizable organics
B606	Resins, tars, or tarry sludge
B607	Biological treatment sludge

Code	Waste description	Code	Waste description
B608	Sewage or other untreated biological sludge		
B609	Other organic sludges (Specify in Comments)		

GASES

INORGANIC GASES - Waste that is primarily inorganic with a low organic content and is a gas at atmospheric pressure

B701	Inorganic gases

ORGANIC GASES - Waste that is primarily organic with low-to-moderate inorganic content and is a gas at atmospheric pressure

B801	Organic gases

SIC Code	Industry

AGRICULTURE

AGRICULTURAL PRODUCTION—CROPS

0111	Wheat
0112	Rice
0115	Corn
0116	Soybeans
0119	Cash grains, nec
0131	Cotton
0132	Tobacco
0133	Sugar cane and sugar beets
0134	Irish potatoes
0139	Field crops, except cash grains, nec
0161	Vegetables and melons
0171	Berry crops
0172	Grapes
0173	Tree nuts
0174	Citrus fruits
0175	Deciduous tree fruits
0179	Fruits and tree nuts, nec
0181	Ornamental nursery products
0182	Food crops grown under cover
0191	General farms, primarily crops

AGRICULTURAL PRODUCTION—LIVESTOCK

0211	Beef cattle feedlots
0212	Beef cattle, except feedlots
0213	Hogs
0214	Sheep and goats
0219	General livestock, nec
0241	Dairy farms
0251	Broiler, fryer, and roaster chickens
0252	Chicken eggs
0253	Turkeys and turkey eggs
0254	Poultry hatcheries
0259	Poultry and eggs, nec
0271	Fur-bearing animals and rabbits
0272	Horses and other equines
0273	Animal aquaculture
0279	Animal specialties, nec
0291	General farms, primarily animal

AGRICULTURAL SERVICES

0711	Soil preparation services
0721	Crop planting and protecting
0722	Crop harvesting
0723	Crop preparation services for market
0724	Cotton ginning
0741	Veterinary services, for livestock
0742	Veterinary services, specialties
0751	Livestock services, except veterinary
0752	Animal specialty services
0761	Farm labor contractors
0762	Farm management services
0781	Landscape counseling and planning
0782	Lawn and garden services
0783	Ornamental shrub and tree services

FORESTRY

0811	Timber tracts
0831	Forest products
0851	Forestry services

FISHING, HUNTING, AND TRAPPING

0912	Finfish
0913	Shellfish
0919	Miscellaneous marine products
0921	Fish hatcheries and preserves
0971	Hunting, trapping, game propagation

MINING

METAL MINING

1011	Iron ores
1021	Copper ores
1031	Lead and zinc ores
1041	Gold ores
1044	Silver ores
1061	Ferroalloy ores, except vanadium
1081	Metal mining services
1094	Uranium, radium, vanadium ores
1099	Metal ores, nec

COAL MINING

1221	Bituminous coal and lignite - surface
1222	Bituminous coal - underground
1231	Anthracite mining
1241	Coal mining services

OIL AND GAS EXTRACTION

1311	Crude petroleum and natural gas
1321	Natural gas liquids
1381	Drilling oil and gas wells
1382	Oil and gas exploration services
1389	Oil and gas field services, nec

NONMETALLIC MINERALS, EXCEPT FUELS

1411	Dimension stone
1422	Crushed and broken limestone
1423	Crushed and broken granite
1429	Crushed and broken stone, nec
1442	Construction sand and gravel
1446	Industrial sand
1455	Kaolin and ball clay
1459	Clay and related minerals, nec
1474	Potash, soda and borate minerals
1475	Phosphate rock
1479	Chemical and fertilizer mining, nec
1481	Nonmetallic minerals services
1499	Miscellaneous nonmetallic minerals, nec

CONSTRUCTION

GENERAL BUILDING CONTRACTORS

1521	Single-family housing construction
1522	Residential construction, nec
1531	Operative builders
1541	Industrial buildings and warehouses
1542	Nonresidential construction, nec

HEAVY CONSTRUCTION, EXCLUDING BUILDINGS

1611	Highway and street construction
1622	Bridge, tunnel, and elevated highway
1623	Water, sewer, and utility lines
1629	Heavy construction, nec

SPECIAL TRADE CONTRACTORS

1711	Plumbing, heating, air conditioning
1721	Painting and paper hanging
1731	Electrical work
1741	Masonry and other stonework
1742	Plastering, drywall, and insulation
1743	Terrazzo, tile, marble, mosaic work
1751	Carpentry work
1752	Floor laying and floor work, nec
1761	Roofing, siding, and sheet metal work
1771	Concrete work
1781	Water well drilling
1791	Structural steel erection
1793	Glass and glazing work
1794	Excavation work
1795	Wrecking and demolition work
1796	Installing building equipment, nec
1799	Special trade contractors, nec

MANUFACTURING

FOOD AND KINDRED PRODUCTS

2011	Meat packing plants
2013	Sausages and other prepared meats
2015	Poultry slaughtering and processing
2021	Creamery butter
2022	Cheese, natural and processed
2023	Dry, condensed, evaporated products
2024	Ice cream and frozen desserts
2026	Fluid milk
2032	Canned specialties
2033	Canned fruits and vegetables
2034	Dehydrated fruits, vegetables, soups
2035	Pickles, sauces, and salad dressings
2037	Frozen fruits and vegetables
2038	Frozen specialties, nec
2041	Flour and other grain mill products
2043	Cereal breakfast foods
2044	Rice milling
2045	Prepared flour mixes and doughs
2046	Wet corn milling
2047	Dog and cat food
2048	Prepared feeds, nec
2051	Bread, cake, and related products
2052	Cookies and crackers
2053	Frozen bakery products, except bread
2061	Raw cane sugar
2062	Cane sugar refining
2063	Beet sugar
2064	Candy and other confectionery products
2066	Chocolate and cocoa products
2067	Chewing gum
2068	Salted and roasted nuts and seeds
2074	Cottonseed oil mills
2075	Soybean oil mills
2076	Vegetable oil mills, nec
2077	Animal and marine fats and oils
2079	Edible fats and oils, nec
2082	Malt beverages
2083	Malt
2084	Wines, brandy, and brandy spirits
2085	Distilled and blended liquors
2086	Bottled and canned soft drinks
2087	Flavoring extracts and syrups, nec
2091	Canned and cured fish and seafood
2092	Fresh or frozen prepared fish
2095	Roasted coffee
2097	Manufactured ice
2098	Macaroni and spaghetti
2099	Food preparations, nec

TOBACCO PRODUCTS

2111	Cigarettes
2121	Cigars
2131	Chewing and smoking tobacco
2141	Tobacco stemming and redrying

TEXTILE MILL PRODUCTS

2211	Broadwoven fabric mills, cotton
2221	Broadwoven fabric mills, man-made
2231	Broadwoven fabric mills, wool
2241	Narrow fabric mills
2251	Women's hosiery, except socks
2252	Hosiery, nec
2253	Knit outerwear mills
2254	Knit underwear mills
2257	Weft knit fabric mills
2258	Lace and warp knit fabric mills
2259	Knitting mills, nec
2261	Finishing plants, cotton
2262	Finishing plants, man-made
2269	Finishing plants, nec
2273	Carpets and rugs
2281	Yarn spinning mills
2282	Throwing and winding mills
2284	Thread mills
2295	Coated fabrics, not rubberized
2296	Tire cord and fabrics
2297	Nonwoven fabrics
2298	Cordage and twine
2299	Textile goods, nec

Note: nec = not elsewhere classified.

SIC CODES
(Continued)

SIC Code	Industry
	APPAREL AND OTHER TEXTILE PRODUCTS
2311	Men's and boys' suits and coats
2321	Men's and boys' shirts
2322	Men's and boys' underwear and nightwear
2323	Men's and boys' neckwear
2325	Men's and boys' trousers and slacks
2326	Men's and boys' work clothing
2329	Men's and boys' clothing, nec
2331	Women's and misses' blouses and shirts
2335	Women's, juniors' and misses' dresses
2337	Women's and misses' suits and coats
2339	Women's and misses' outerwear, nec
2341	Women's and children's underwear
2342	Bras, girdles, and allied garments
2353	Hats, caps, and millinery
2361	Girls' and children's dresses, blouses
2369	Girls' and children's outerwear, nec
2371	Fur goods
2381	Fabric dress and work gloves
2384	Robes and dressing gowns
2385	Waterproof outerwear
2386	Leather and sheep lined clothing
2387	Apparel belts
2389	Apparel and accessories, nec
2391	Curtains and draperies
2392	House furnishings, nec
2393	Textile bags
2394	Canvas and related products
2395	Pleating and stitching
2396	Automotive and apparel trimmings
2397	Schiffli machine embroideries
2399	Fabricated textile products, nec
	LUMBER AND WOOD PRODUCTS
2411	Logging
2421	Sawmills and planing mills, general
2426	Hardwood dimension and flooring mills
2429	Special product sawmills, nec
2431	Millwork
2434	Wood kitchen cabinets
2435	Hardwood veneer and plywood
2436	Softwood veneer and plywood
2439	Structural wood members, nec
2441	Nailed wood boxes and shook
2448	Wood pallets and skids
2449	Wood containers, nec
2451	Mobile homes
2452	Prefabricated wood buildings
2491	Wood preserving
2493	Reconstituted wood products
2499	Wood products, nec
	FURNITURE AND FIXTURES
2511	Wood household furniture
2512	Upholstered household furniture
2514	Metal household furniture
2515	Mattresses and bedsprings
2517	Wood TV and radio cabinets
2519	Household furniture, nec
2521	Wood office furniture
2522	Office furniture, except wood
2531	Public building and related furniture
2541	Wood partitions and fixtures
2542	Partitions and fixtures, except wood
2591	Drapery hardware and blinds and shades
2599	Furniture and fixtures, nec
	PAPER AND ALLIED PRODUCTS
2611	Pulp mills
2621	Paper mills
2631	Paperboard mills
2652	Set-up paperboard boxes
2653	Corrugated and solid fiber boxes
2655	Fiber cans, drums, and similar products
2656	Sanitary food containers
2657	Folding paperboard boxes
2671	Paper coated and laminated, packaging
2672	Paper coated and laminated, nec
2673	Bags - plastics, laminated and coated
2674	Bags - uncoated paper and multiwall
2675	Die-cut paper and board
2676	Sanitary paper products
2677	Envelopes
2678	Stationery products
2679	Converted paper products, nec
	PRINTING AND PUBLISHING
2711	Newspapers
2721	Periodicals
2731	Book publishing
2732	Book printing
2741	Miscellaneous publishing
2752	Commercial printing, lithographic
2754	Commercial printing, gravure
2759	Commercial printing, nec
2761	Manifold business forms
2771	Greeting cards
2782	Blankbooks and looseleaf binders
2789	Bookbinding and related work
2791	Typesetting
2796	Plate making services
	CHEMICALS AND ALLIED PRODUCTS
2812	Alkalies and chlorine
2813	Industrial gases
2816	Inorganic pigments
2819	Industrial inorganic chemicals, nec
2821	Plastics materials and resins
2822	Synthetic rubber
2823	Cellulosic man-made fibers
2824	Organic fibers, noncellulosic
2833	Medicinals and botanicals
2834	Pharmaceutical preparations
2835	Diagnostic substances
2836	Biological products, except diagnostic
2841	Soap and other detergents
2842	Polishes and sanitation goods
2843	Surface active agents
2844	Toilet preparations
2851	Paints and allied products
2861	Gum and wood chemicals
2865	Cyclic crudes and intermediates
2869	Industrial organic chemicals, nec
2873	Nitrogenous fertilizers
2874	Phosphatic fertilizers
2875	Fertilizers, mixing only
2879	Agricultural chemicals, nec
2891	Adhesives and sealants
2892	Explosives
2893	Printing ink
2895	Carbon black
2899	Chemical preparations, nec
	PETROLEUM AND COAL PRODUCTS
2911	Petroleum refining
2951	Asphalt paving mixtures and blocks
2952	Asphalt felts and coatings
2992	Lubricating oils and greases
2999	Petroleum and coal products, nec
	RUBBER AND MISCELLANEOUS PLASTIC PRODUCTS
3011	Tires and inner tubes
3021	Rubber and plastics footwear
3052	Rubber and plastics hose and belting
3053	Gaskets, packing and sealing devices
3061	Mechanical rubber goods
3069	Fabricated rubber products, nec
3081	Unsupported plastics, film and sheet
3082	Unsupported plastics, profile shapes
3083	Laminated plastics, plate and sheet
3084	Plastics, pipe
3085	Plastics, bottles
3086	Plastics, foam products
3087	Custom compound purchased resins
3088	Plastics, plumbing fixtures
3089	Plastics products, nec
	LEATHER AND LEATHER PRODUCTS
3111	Leather tanning and finishing
3131	Footwear, cut stock
3142	House slippers
3143	Men's footwear, except athletic
3144	Women's footwear, except athletic
3149	Footwear, except rubber, nec
3151	Leather gloves and mittens
3161	Luggage
3171	Women's handbags and purses
3172	Personal leather goods, nec
3199	Leather goods, nec
	STONE, CLAY, AND GLASS PRODUCTS
3211	Flat glass
3221	Glass containers
3229	Pressed and blown glass, nec
3231	Products of purchased glass
3241	Cement, hydraulic
3251	Brick and structural clay tile
3253	Ceramic wall and floor tile
3255	Clay refractories
3259	Structural clay products, nec
3261	Vitreous plumbing fixtures
3262	Vitreous china table and kitchenware
3263	Semivitreous table and kitchenware
3264	Porcelain electrical supplies
3269	Pottery products, nec
3271	Concrete block and brick
3272	Concrete products, nec
3273	Ready-mixed concrete
3274	Lime
3275	Gypsum products
3281	Cut stone and stone products
3291	Abrasive products
3292	Asbestos products
3295	Minerals, ground or treated
3296	Mineral wool
3297	Nonclay refractories
3299	Nonmetallic mineral products, nec
	PRIMARY METAL INDUSTRIES
3312	Blast furnaces and steel mills
3313	Electrometallurgical products
3315	Steel wire and related products
3316	Cold finishing of steel shapes
3317	Steel pipe and tubes
3321	Gray and ductile iron foundries
3322	Malleable iron foundries
3324	Steel investment foundries
3325	Steel foundries, nec
3331	Primary copper
3334	Primary aluminum
3339	Primary nonferrous metals, nec
3341	Secondary nonferrous metals
3351	Copper rolling and drawing
3353	Aluminum sheet, plate, and foil
3354	Aluminum extruded products
3355	Aluminum rolling and drawing, nec
3356	Nonferrous rolling and drawing, nec
3357	Nonferrous wire drawing and insulating
3363	Aluminum die-castings
3364	Nonferrous die-castings, except aluminum
3365	Aluminum foundries
3366	Copper foundries
3369	Nonferrous foundries, nec
3398	Metal heat treating
3399	Primary metal products, nec
	FABRICATED METAL PRODUCTS
3411	Metal cans
3412	Metal barrels, drums, and pails
3421	Cutlery
3423	Hand and edge tools, nec
3425	Saw blades and handsaws
3429	Hardware, nec

Note: nec = not elsewhere classified.

SIC CODES
(Continued)

SIC Code	Industry
3431	Metal sanitary ware
3432	Plumbing fixture fittings and trim
3433	Heating equipment, except electric
3441	Fabricated structural metal
3442	Metal doors, sash, and trim
3443	Fabricated plate work (boiler shops)
3444	Sheet metal work
3446	Architectural metal work
3448	Prefabricated metal buildings
3449	Miscellaneous metal work
3451	Screw machine products
3452	Bolts, nuts, rivets, and washers
3462	Iron and steel forgings
3463	Nonferrous forgings
3465	Automotive stampings
3466	Crowns and closures
3469	Metal stampings, nec
3471	Plating and polishing
3479	Metal coating and allied services
3482	Small arms ammunition
3483	Ammunition, except for small arms, nec
3484	Small arms
3489	Ordnance and accessories, nec
3491	Industrial valves
3492	Fluid power valves and hose fittings
3493	Steel springs, except wire
3494	Valves and pipe fittings, nec
3495	Wire springs
3496	Miscellaneous fabricated wire products
3497	Metal foil and leaf
3498	Fabricated pipe and fittings
3499	Fabricated metal products, nec

INDUSTRIAL MACHINERY AND EQUIPMENT

3511	Turbines and turbine generator sets
3519	Internal combustion engines, nec
3523	Farm machinery and equipment
3524	Lawn and garden equipment
3531	Construction machinery
3532	Mining machinery
3533	Oil and gas field machinery
3534	Elevators and moving stairways
3535	Conveyors and conveying equipment
3536	Hoists, cranes, and monorails
3537	Industrial trucks and tractors
3541	Machine tools, metal cutting types
3542	Machine tools, metal forming types
3543	Industrial patterns
3544	Special dies, tools, jigs, and fixture
3545	Machine tool accessories
3546	Power driven hand tools
3547	Rolling mill machinery
3548	Welding apparatus
3549	Metalworking machinery, nec
3552	Textile machinery
3553	Woodworking machinery
3554	Paper industries machinery
3555	Printing trades machinery
3556	Food products machinery
3559	Special industry machinery, nec
3561	Pumps and pumping equipment
3562	Ball and roller bearings
3563	Air and gas compressors
3564	Blowers and fans
3565	Packaging machinery
3566	Speed changers, drives, and gears
3567	Industrial furnaces and ovens
3568	Power transmission equipment, nec
3569	General industrial machinery, nec
3571	Electronic computers
3572	Computer storage devices
3575	Computer terminals
3577	Computer peripheral equipment, nec
3578	Calculating and accounting equipment
3579	Office machines, nec
3581	Automatic vending machines
3582	Commercial laundry equipment
3585	Refrigeration and heating equipment
3586	Measuring and dispensing pumps
3589	Service industry machinery, nec
3592	Carburetors, pistons, rings, valves
3593	Fluid power cylinders and actuators
3594	Fluid power pumps and motors
3596	Scales and balances, except laboratory
3599	Industrial machinery, nec

ELECTRONIC AND OTHER ELECTRIC EQUIPMENT

3612	Transformers, except electronic
3613	Switchgear and switchboard apparatus
3621	Motors and generators
3624	Carbon and graphite products
3625	Relays and industrial controls
3629	Electrical industrial apparatus, nec
3631	Household cooking equipment
3632	Household refrigerators and freezers
3633	Household laundry equipment
3634	Electric housewares and fans
3635	Household vacuum cleaners
3639	Household appliances, nec
3641	Electric lamps
3643	Current-carrying wiring devices
3644	Noncurrent-carrying wiring devices
3645	Residential lighting fixtures
3646	Commercial lighting fixtures
3647	Vehicular lighting equipment
3648	Lighting equipment, nec
3651	Household audio and video equipment
3652	Prerecorded records and tapes
3661	Telephone and telegraph apparatus
3663	Radio and TV communication equipment
3669	Communications equipment, nec
3671	Electron tubes
3672	Printed circuit boards
3674	Semiconductors and related devices
3675	Electronic capacitors
3676	Electronic resistors
3677	Electronic coils and transformers
3678	Electronic connectors
3679	Electronic components, nec
3691	Storage batteries
3692	Primary batteries, dry and wet
3694	Engine electrical equipment
3695	Magnetic and optical recording media
3699	Electrical equipment and supplies, nec

TRANSPORTATION EQUIPMENT

3711	Motor vehicles and car bodies
3713	Truck and bus bodies
3714	Motor vehicle parts and accessories
3715	Truck trailers
3716	Motor homes
3721	Aircraft
3724	Aircraft engines and engine parts
3728	Aircraft parts and equipment, nec
3731	Ship building and repairing
3732	Boat building and repairing
3743	Railroad equipment
3751	Motorcycles, bicycles, and parts
3761	Guided missiles and space vehicles
3764	Space propulsion units and parts
3769	Space vehicle equipment, nec
3792	Travel trailers and campers
3795	Tanks and tank components
3799	Transportation equipment, nec

INSTRUMENTS AND RELATED PRODUCTS

3812	Search and navigation equipment
3821	Laboratory apparatus and furniture
3822	Environmental controls
3823	Process control instruments
3824	Fluid meters and counting devices
3825	Instruments to measure electricity
3826	Analytical instruments
3827	Optical instruments and lenses
3829	Measuring and controlling devices, nec
3841	Surgical and medical instruments
3842	Surgical appliances and supplies
3843	Dental equipment and supplies
3844	X-ray apparatus and tubes
3845	Electromedical equipment
3851	Ophthalmic goods
3861	Photographic equipment and supplies
3873	Watches, clocks, watchcases, and parts

MISCELLANEOUS MANUFACTURING INDUSTRIES

3911	Jewelry, precious metal
3914	Silverware and plated ware
3915	Jewelers' materials and lapidary work
3931	Musical instruments
3942	Dolls and stuffed toys
3944	Games, toys, and children's vehicles
3949	Sporting and athletic goods, nec
3951	Pens and mechanical pencils
3952	Lead pencils and art goods
3953	Marking devices
3955	Carbon paper and inked ribbons
3961	Costume jewelry
3965	Fasteners, buttons, needles, and pins
3991	Brooms and brushes
3993	Signs and advertising specialties
3995	Burial caskets
3996	Hard surface floor coverings, nec
3999	Manufacturing industries, nec

TRANSPORTATION AND UTILITIES

RAILROAD TRANSPORTATION

4011	Railroads, line-haul operating
4013	Switching and terminal services

LOCAL AND INTERURBAN PASSENGER TRANSIT

4111	Local and suburban transit
4119	Local passenger transportation, nec
4121	Taxicabs
4131	Intercity and rural bus transportation
4141	Local bus charter service
4142	Bus charter service, except local
4151	School buses
4173	Bus terminal and service facilities

TRUCKING AND WAREHOUSING

4212	Local trucking, without storage
4213	Trucking, except local
4214	Local trucking with storage
4215	Courier services, except by air
4221	Farm product warehousing and storage
4222	Refrigerated warehousing and storage
4225	General warehousing and storage
4226	Special warehousing and storage, nec
4231	Trucking terminal facilities

U.S. POSTAL SERVICE

4311	U.S. Postal Service

WATER TRANSPORTATION

4412	Deep sea foreign transportation of freight
4424	Deep sea domestic trans. of freight
4432	Freight transportation, on the Great Lakes
4449	Water transportation of freight, nec
4481	Deep sea passenger trans., except ferry
4482	Ferries
4489	Water passenger transportation, nec
4491	Marine cargo handling
4492	Towing and tugboat service
4493	Marinas
4499	Water transportation services, nec

Note: nec = not elsewhere classified.

SIC CODES
(Continued)

SIC Code	Industry

TRANSPORTATION BY AIR
- 4512 Air transportation, scheduled
- 4513 Air courier services
- 4522 Air transportation, nonscheduled
- 4581 Airports, flying fields, and services

PIPELINES, EXCEPT NATURAL GAS
- 4612 Crude petroleum pipelines
- 4613 Refined petroleum pipelines
- 4619 Pipelines, nec

TRANSPORTATION SERVICES
- 4724 Travel agencies
- 4725 Tour operators
- 4728 Passenger transportation arrangement, nec
- 4731 Freight transportation arrangement
- 4741 Rental of railroad cars
- 4783 Packing and crating
- 4785 Inspection and fixed facilities
- 4789 Transportation services, nec

COMMUNICATIONS
- 4812 Radiotelephone communications
- 4813 Telephone communications, except radio
- 4822 Telegraph and other communications
- 4832 Radio broadcasting stations
- 4833 Television broadcasting stations
- 4841 Cable and other pay TV services
- 4899 Communication services, nec

ELECTRIC, GAS, AND SANITARY SERVICES
- 4911 Electric services
- 4922 Natural gas transmission
- 4923 Gas transmission and distribution
- 4924 Natural gas distribution
- 4925 Gas production and/or distribution
- 4931 Electric and other services combined
- 4932 Gas and other services combined
- 4939 Combination utilities, nec
- 4941 Water supply
- 4952 Sewerage systems
- 4953 Refuse systems
- 4959 Sanitary services, nec
- 4961 Steam and air conditioning supply
- 4971 Irrigation systems

WHOLESALE TRADE

WHOLESALE TRADE, DURABLE GOODS
- 5012 Automobiles and other motor vehicles
- 5013 Motor vehicle supplies and new parts
- 5014 Tires and tubes
- 5015 Motor vehicle parts, used
- 5021 Furniture
- 5023 Home furnishings
- 5031 Lumber, plywood, and millwork
- 5032 Brick, stone, and related materials
- 5033 Roofing, siding, and insulation
- 5039 Construction materials, nec
- 5043 Photographic equipment and supplies
- 5044 Office equipment
- 5045 Computers, peripherals, and software
- 5046 Commercial equipment, nec
- 5047 Medical and hospital equipment
- 5048 Ophthalmic goods
- 5049 Professional equipment, nec
- 5051 Metals service centers and offices
- 5052 Coal and other minerals and ores
- 5063 Electrical apparatus and equipment
- 5064 Electrical appliances, TV and radios
- 5065 Electronic parts and equipment
- 5072 Hardware
- 5074 Plumbing and hydronic heating supplies
- 5075 Warm air heating and air conditioning
- 5078 Refrigeration equipment and supplies
- 5082 Construction and mining machinery
- 5083 Farm and garden machinery
- 5084 Industrial machinery and equipment
- 5085 Industrial supplies
- 5087 Service establishment equipment
- 5088 Transportation equipment and supplies
- 5091 Sporting and recreational goods
- 5092 Toys and hobby goods and supplies
- 5093 Scrap and waste materials
- 5094 Jewelry and precious stones
- 5099 Durable goods, nec

WHOLESALE TRADE, NONDURABLE GOODS
- 5111 Printing and writing paper
- 5112 Stationery and office supplies
- 5113 Industrial and personal service paper
- 5122 Drugs, proprietaries, and sundries
- 5131 Piece goods and notions
- 5136 Men's and boys' clothing
- 5137 Women's and children's clothing
- 5139 Footwear
- 5141 Groceries, general line
- 5142 Packaged frozen foods
- 5143 Dairy products, except dried or canned
- 5144 Poultry and poultry products
- 5145 Confectionery
- 5146 Fish and seafoods
- 5147 Meats and meat products
- 5148 Fresh fruits and vegetables
- 5149 Groceries and related products, nec
- 5153 Grain and field beans
- 5154 Livestock
- 5159 Farm-product raw materials, nec
- 5162 Plastics materials and basic shapes
- 5169 Chemicals and allied products, nec
- 5171 Petroleum bulk stations and terminals
- 5172 Petroleum products, nec
- 5181 Beer and ale
- 5182 Wines and distilled beverages
- 5191 Farm supplies
- 5192 Books, periodicals, and newspapers
- 5193 Flowers and florists' supplies
- 5194 Tobacco and tobacco products
- 5198 Paints, varnishes, and supplies
- 5199 Nondurable goods, nec

RETAIL TRADE

BUILDING MATERIALS AND GARDEN SUPPLIES
- 5211 Lumber and other building materials
- 5231 Paint, glass, and wallpaper stores
- 5251 Hardware stores
- 5261 Retail nurseries and gardens
- 5271 Mobile home dealers

GENERAL MERCHANDISE STORES
- 5311 Department stores
- 5331 Variety stores
- 5399 Miscellaneous general merchandise stores

FOOD STORES
- 5411 Grocery stores
- 5421 Meat and fish markets
- 5431 Fruit and vegetable markets
- 5441 Candy, nut, and confectionery stores
- 5451 Dairy products stores
- 5461 Retail bakers
- 5499 Miscellaneous food stores

AUTOMOTIVE DEALERS AND SERVICE STATIONS
- 5511 New and used car dealers
- 5521 Used car dealers
- 5531 Auto and home supply stores
- 5541 Gasoline service stations
- 5551 Boat dealers
- 5561 Recreational vehicle dealers
- 5571 Motorcycle dealers
- 5599 Automotive dealers, nec

APPAREL AND ACCESSORY STORES
- 5611 Men's and boys' clothing stores
- 5621 Women's clothing stores
- 5632 Women's accessory and specialty stores
- 5641 Children's and infants' wear stores
- 5651 Family clothing stores
- 5661 Shoe stores
- 5699 Miscellaneous apparel and accessory stores

FURNITURE AND HOME FURNISHINGS STORES
- 5712 Furniture stores
- 5713 Floor covering stores
- 5714 Drapery and upholstery stores
- 5719 Miscellaneous home furnishings stores
- 5722 Household appliance stores
- 5731 Radio, TV, and electronic stores
- 5734 Computer and software stores
- 5735 Record and prerecorded tape stores
- 5736 Musical instruments stores

EATING AND DRINKING PLACES
- 5812 Eating places
- 5813 Drinking places

MISCELLANEOUS RETAIL
- 5912 Drug stores and proprietary stores
- 5921 Liquor stores
- 5932 Used merchandise stores
- 5941 Sporting goods and bicycle shops
- 5942 Book stores
- 5943 Stationery stores
- 5944 Jewelry stores
- 5945 Hobby, toy, and game shops
- 5946 Camera and photographic supply stores
- 5947 Gift, novelty, and souvenir shops
- 5948 Luggage and leather goods stores
- 5949 Sewing, needlework, and piece goods
- 5961 Catalog and mail order houses
- 5962 Merchandising machine operators
- 5963 Direct selling organizations
- 5983 Fuel oil dealers
- 5989 Fuel dealers, nec
- 5984 Liquefied petroleum gas dealers
- 5992 Florists
- 5993 Cigar stores and stands
- 5994 News dealers and newsstands
- 5995 Optical goods stores
- 5999 Miscellaneous retail stores, nec

FINANCE, INSURANCE & REAL ESTATE

DEPOSITORY INSTITUTIONS
- 6011 Federal Reserve banks
- 6019 Central reserve depository, nec
- 6021 National commercial banks
- 6022 State commercial banks
- 6029 Commercial banks, nec
- 6035 Federal savings institutions
- 6036 Savings institutions, except federal
- 6061 Federal credit unions
- 6062 State credit unions
- 6081 Foreign banks and branches and agencies
- 6082 Foreign trade and international banks
- 6091 Nondeposit trust facilities
- 6099 Functions related to deposit banking

NONDEPOSITORY INSTITUTIONS
- 6111 Federal and federally-sponsored credit
- 6141 Personal credit institutions
- 6153 Short-term business credit
- 6159 Miscellaneous business credit institutions
- 6162 Mortgage bankers and correspondents
- 6163 Loan brokers

Note: nec = not elsewhere classified.

SIC CODES
(Continued)

SIC Code	Industry
SECURITY AND COMMODITY BROKERS	
6211	Security brokers and dealers
6221	Commodity contracts brokers, dealers
6231	Security and commodity exchanges
6282	Investment advice
6289	Security and commodity services, nec
INSURANCE CARRIERS	
6311	Life insurance
6321	Accident and health insurance
6324	Hospital and medical service plans
6331	Fire, marine, and casualty insurance
6351	Surety insurance
6361	Title insurance
6371	Pension, health, and welfare funds
6399	Insurance carriers, nec
INSURANCE AGENTS, BROKERS, AND SERVICE	
6411	Insurance agents, brokers, and service
REAL ESTATE	
6512	Nonresidential building operators
6513	Apartment building operators
6514	Dwelling operators, except apartments
6515	Mobile home site operators
6517	Railroad property lessors
6519	Real property lessors, nec
6531	Real estate agents and managers
6541	Title abstract offices
6552	Subdividers and developers, nec
6553	Cemetery subdividers and developers
HOLDING AND OTHER INVESTMENT OFFICES	
6712	Bank holding companies
6719	Holding companies, nec
6722	Management investment, open-end
6726	Investment offices, nec
6732	Educational, religious, etc. trusts
6733	Trusts, nec
6792	Oil royalty traders
6794	Patent owners and lessors
6798	Real estate investment trusts
6799	Investors, nec

SERVICES

SIC Code	Industry
HOTELS AND OTHER LODGING PLACES	
7011	Hotels and motels
7021	Rooming and boarding houses
7032	Sporting and recreational camps
7033	Trailer parks and campsites
7041	Membership-basis organization hotels
PERSONAL SERVICES	
7211	Power laundries, family and commercial
7212	Garment pressing and agents
7213	Linen supply
7215	Coin-operated laundries and cleaning
7216	Dry cleaning plants, except rug
7217	Carpet and upholstery cleaning
7218	Industrial laundries
7219	Laundry and garment services, nec
7221	Photographic studios, portrait
7231	Beauty shops
7241	Barber shops
7251	Shoe repair and shoeshine shops
7261	Funeral service and crematories
7291	Tax return preparation services
7299	Miscellaneous personal services, nec
BUSINESS SERVICES	
7311	Advertising agencies
7312	Outdoor advertising services
7313	Radio, TV, publisher representatives
7319	Advertising, nec
7322	Adjustment and collection services
7323	Credit reporting services
7331	Direct mail advertising services
7334	Photocopying and duplicating services
7335	Commercial photography
7336	Commercial art and graphic design
7338	Secretarial and court reporting
7342	Disinfecting and pest control services
7349	Building maintenance services, nec
7352	Medical equipment rental
7353	Heavy construction equipment rental
7359	Equipment rental and leasing, nec
7361	Employment agencies
7363	Help supply services
7371	Computer programming services
7372	Prepackaged software
7373	Computer integrated systems design
7374	Data processing services
7375	Information retrieval services
7376	Computer facilities management
7377	Computer rental and leasing
7378	Computer maintenance and repair
7379	Computer related services, nec
7381	Detective and armored car services
7382	Security systems services
7383	News syndicates
7384	Photofinishing laboratories
7389	Business services, nec
AUTOMOTIVE REPAIR, SERVICES, AND PARKING	
7513	Truck rental and leasing, no drivers
7514	Passenger car rental
7515	Passenger car leasing
7519	Utility trailer rental
7521	Automobile parking
7532	Top and body repair and paint shops
7533	Auto exhaust system repair shops
7534	Tire retreading and repair shops
7536	Automotive glass replacement shops
7537	Automotive transmission repair shops
7538	General automotive repair shops
7539	Automotive repair shops, nec
7542	Car washes
7549	Automotive services, nec
MISCELLANEOUS REPAIR SERVICES	
7622	Radio and television repair
7623	Refrigeration service and repair
7629	Electrical repair shops, nec
7631	Watch, clock, and jewelry repair
7641	Reupholstery and furniture repair
7692	Welding repair
7694	Armature rewinding shops
7699	Repair services, nec
MOTION PICTURES	
7812	Motion picture and video production
7819	Services allied to motion pictures
7822	Motion picture and tape distribution
7829	Motion picture distribution services
7832	Motion picture theaters except drive-in
7833	Drive-in motion picture theaters
7841	Video tape rental
AMUSEMENT AND RECREATION SERVICES	
7911	Dance studios, schools, and halls
7922	Theatrical producers and services
7929	Entertainers and entertainment groups
7933	Bowling centers
7941	Sports clubs, managers, and promoters
7948	Racing, including track operation
7991	Physical fitness facilities
7992	Public golf courses
7993	Coin-operated amusement devices
7996	Amusement parks
7997	Membership sports and recreation clubs
7999	Amusement and recreation, nec
HEALTH SERVICES	
8011	Offices and clinics of medical doctors
8021	Offices and clinics of dentists
8031	Offices of osteopathic physicians
8041	Offices and clinics of chiropractors
8042	Offices and clinics of optometrists
8043	Office and clinics of podiatrists
8049	Offices of health practitioners, nec
8051	Skilled nursing care facilities
8052	Intermediate care facilities
8059	Nursing and personal care, nec
8062	General medical and surgical hospitals
8063	Psychiatric hospitals
8069	Specialty hospitals, except psychiatric
8071	Medical laboratories
8072	Dental laboratories
8082	Home health care services
8092	Kidney dialysis centers
8093	Specialty outpatient clinics, nec
8099	Health and allied services, nec
LEGAL SERVICES	
8111	Legal services
EDUCATIONAL SERVICES	
8211	Elementary and secondary schools
8221	Colleges and universities
8222	Junior colleges
8231	Libraries
8243	Data processing schools
8244	Business and secretarial schools
8249	Vocational schools, nec
8299	Schools and educational services, nec
SOCIAL SERVICES	
8322	Individual and family services
8331	Job training and related services
8351	Child day care services
8361	Residential care
8399	Social services, nec
MUSEUMS, BOTANICAL, ZOOLOGICAL GARDENS	
8412	Museums and art galleries
8422	Botanical and zoological gardens
MEMBERSHIP ORGANIZATIONS	
8611	Business associations
8621	Professional organizations
8631	Labor organizations
8641	Civic and social associations
8651	Political organizations
8661	Religious organizations
8699	Membership organizations, nec
ENGINEERING AND MANAGEMENT SERVICES	
8711	Engineering services
8712	Architectural services
8713	Surveying services
8721	Accounting, auditing, and bookkeeping
8731	Commercial physical research
8732	Commercial nonphysical research
8733	Noncommercial research organizations
8734	Testing laboratories
8741	Management services
8742	Management consulting services
8743	Public relations services
8744	Facilities support services
8748	Business consulting, nec
PRIVATE HOUSEHOLDS	
8811	Private households
SERVICES, NEC	
8999	Services, nec

Note. nec = not elsewhere classified.

SIC CODES
(Continued)

SIC Code	Industry	SIC Code	Industry	SIC Code	Industry

PUBLIC ADMINISTRATION

EXECUTIVE, LEGISLATIVE, AND GENERAL
9111 Executive offices
9121 Legislative bodies
9131 Executive and legislative combined
9199 General government, nec

JUSTICE, PUBLIC ORDER, AND SAFETY
9211 Courts
9221 Police protection
9222 Legal counsel and prosecution
9223 Correctional institutions
9224 Fire protection
9229 Public order and safety, nec

FINANCE, TAXATION, AND MONETARY POLICY
9311 Finance, taxation, and monetary policy

ADMINISTRATION OF HUMAN RESOURCES
9411 Administration of educational programs
9431 Administration of public health programs
9441 Administration of social and manpower programs
9451 Administration of veterans' affairs

ENVIRONMENTAL QUALITY, AND HOUSING
9511 Air, water, and solid waste management
9512 Land, mineral, wildlife conservation
9531 Housing programs
9532 Urban and community development

ADMINISTRATION OF ECONOMIC PROGRAMS
9611 Admin. of general economic programs
9621 Regulation, admin. of transportation
9631 Regulation, administration of utilities
9641 Regulation of agricultural marketing
9651 Regulation of misc. commercial sectors
9661 Space research and technology

NATIONAL SECURITY AND INTERNATIONAL AFFAIRS
9711 National security
9721 International affairs

NONCLASSIFIABLE ESTABLISHMENTS

9999 Nonclassifiable establishment

Note: nec = not elsewhere classified.

Code	Origin Description
1	The hazardous waste stream was generated on site from a production process or service activity (including off-specification or spent chemicals).
2	The hazardous waste stream was the result of a spill cleanup, equipment decommissioning, or other remedial cleanup activity.
3	The hazardous waste stream was derived from the management of a non-hazardous waste stream.
4	The hazardous waste stream was received from off site and was not recycled or treated on site.
5	The hazardous waste stream was a residual from the on site treatment, disposal, or recycling of previously existing hazardous waste stream.

APPENDIX 3
MATCHING PROCESS - WR/GM

APPENDIX 3: MATCHING PROCESS - WR/GM

This Appendix summarizes EPA's manual and automated merging of GM and WR Forms data for source characterization of the wastes managed off site. As described in Chapter 2, EPA is using WR Form data to characterize the management of the wastes combusted off site, and source data (i.e., SIC code of the process generating the waste, origin code, and source code) are not listed on this form. Source data are needed to determine how wastes were generated and identify waste minimization opportunities, and thus, it is important to link the WR forms to GM forms as accurately as possible in order to promote waste minimization for wastes managed off site.

EPA used both automated and manual techniques to merge WR data with corresponding GM data. The automated mapping was done for both combusted and fuel-blended wastes[1]. The manual merging was done only for the combusted wastes. The first step in the merging process was the aggregation of data by routing information (i.e., generator and management facility IDs), RCRA waste codes, management system type, and waste form codes; these information elements are common to both GM and WR Forms. The merging was done in three stages:

1. Initial automated "exact" merging;
2. Manual matching of data for the top 50 wastestreams; and
3. Final automated "relaxed" merging.

These three steps are described below:

Step 1. Automated "Exact" Merging: The objective of the initial automated "exact" merge was to obtain waste stream-specific source information from the data without making any concessions in the matching criteria. This process resulted in a poor match of the common information between GM and WR Forms. Only 9,696 records, contributing a volume of 82,719 tons of combusted and fuel-blended wastes (including 1,104 records of combusted wastes with 65,200 tons, or about two percent of off-site combusted waste quantity), were matched in this stage.

Step 2. Manual Matching: Of the remaining non-match combustion records (25,257 records representing 1.1 million tons of combusted waste), the top 50 records accounted for about 40 percent of the total waste quantity. EPA used a manual process, as described in Attachment 1, to match the GM and WR forms' information. This process resulted in identifying source data for an additional 33 records contributing a quantity of 220,102 tons, or about 25 percent of the off-site combusted waste quantity. Moreover, this step provided some insight on how to set up decision rules for the final step.

Step 3. Automated "Relaxed" Merging: EPA aggregated the remaining non-matched records (107,552 records contributing 3.9 million tons, or 91 percent, of combusted and fuel-blended wastes) by routing information, RCRA waste codes, management system type, and waste

[1] Fuel-blended wastes were later dropped from the analysis in order to focus on combusted wastes.

form grouping code (see Exhibit 1 of Attachment 1 for a list of the waste form groups). These records were electronically mapped to the GM forms data using routing (i.e., generator sending the waste and managing facility receiving waste are identical on the GM and WR forms) and RCRA waste code information. Where there were perfect matches for routing and RCRA waste code data, the source data were obtained from the GM Form. This process resulted in mapping of 14,891 records contributing 593,699 tons of waste.

EPA aggregated the remaining non-matched records (88,375 records) to make a smaller file for downloading into the PC environment. EPA's strategy for downloading was as follows:

- For records with quantities greater than or equal to 1 ton, keep all data as reported. There are 36,744 records representing 3,367,719 tons in this category.

- For records with volumes less than or equal to 1 ton, aggregate by receiving facility ID, generator state (i.e., first two characters of the generator ID), waste code(s), management system type, and waste form group code (see Exhibit 1). This results in losing information on individual generator ID and individual form codes. In this step, 51,631 records collapsed to 22,957 records representing 18,089 tons.

Overall, for combusted and fuel-blended wastes, the aggregation and merging results are as follows:

Waste Type	With Source-specific Information		Without Source-specific Information		Total	
	Records	Tons	Records	Tons	Records	Tons
Combusted Wastes	7,716	474,363 (40%)	21,802	716,568 (60%)	29,518	1,190,931
Combusted and Fuel-blended Wastes	24,587	896,520 (21%)	59,701	3,385,808 (79%)	84,288	4,282,328

Please note that due to non-reporting of data in the GM Forms, even for perfectly matched records some of the source data could be missing. Thus, even after matching there are only 462,203 tons of waste with SIC code information and 437,394 tons of waste with source code information for off site combusted wastes.

Attachment 1. Manual Matching of GM and WR Forms for Selected Combusted Wastes

This attachment details the methodology and results of the manual matching done for selected combusted waste streams identified in the WR Forms that could not be electronically matched to the GM Forms. The primary objective of the matching process is to obtain source data (i.e., source, origin and SIC codes) for routinely-generated wastes identified in the WR Forms. The data obtained from the matching would be used in identifying and prioritizing the sources of combusted hazardous wastes.

There are about 30,000 WR Form records for which source data could not be obtained by automated "exact" matching and merging. The top 50 records from the non-matched WR Form records contribute to about 42 percent of the non-matched waste quantity and the top 1,300 records contribute to about 76 percent of the total non-matched waste quantity. Hence, the manual matching was done for the top 50 waste streams in order to address a significant percentage of the unmatched quantity and to develop and implement an automated programming logic for establishing source data for most of the remaining non-match records.

The first step of the manual matching was to ascertain that the waste routing information is accurate (i.e., EPA IDs reported in GM and WR Forms are identical). If this condition could not be fulfilled, it was assumed that the waste stream in the WR Form could not be matched to the GM Form. After the routing information was verified, then the data in the WR and GM Forms were assumed to be matched if they met at least two of the following three conditions:

(1) The waste form codes of the waste stream in the GM and WR Forms indicate similar wastes. The groups of waste form codes that were considered to be similar for this analysis are given in Exhibit 1.

(2) At least one of the RCRA hazardous waste codes of the waste stream as reported in the GM Form is also reported in the WR Form.

(3) The quantity of the waste stream reported in the GM Form is within 25 percent of the quantity reported in the WR Form.

Exhibit 2 presents the results of the manual matching. The analysis indicate that the matches between the WR and GM Forms were often poor. After using the broad assumptions outlined above, 33 of the 50 top non-matched WR Form wastes were matched. For these 33 waste streams, the summary findings are presented below:

- For 13 of the 33 waste streams:
  - the waste form codes were similar (based on Exhibit 1);
  - at least one of the EPA hazardous waste codes matched; and
  - the reported quantities were within 25 percent between the WR and GM Form data.

- For 11 of the remaining 20 waste streams:
  - at least one of the EPA hazardous waste codes matched; and
  - the reported quantities were within 25 percent between the WR and GM Form data;

- For six of the remaining 9 waste streams:
  - the waste form codes were similar (based on Exhibit 1); and
  - at least one of the EPA hazardous waste codes matched between the WR and GM Form data.

- For the remaining three waste streams:
  - the waste form codes were similar (based on Exhibit 1); and
  - the reported quantities were within 25 percent between the WR and GM Form data.

For the 17 WR Form wastes that could not be matched, listed are some of the reasons why the matching could not be done:

- For four waste streams, the WR Form identified a generator ID that is not in the BRS;

- For one waste stream, the WR Form identified a generator that had no GM Forms;

- For seven waste streams, the GM Forms of the generators identified in the WR Forms did not report shipping wastes to the receiver in 1991; and

- For five waste streams, though the GM Forms did report shipping some wastes to the receiver, none of the waste streams could be matched since, for each of these waste streams at least two of the three conditions outlined above were not fulfilled between the WR and GM Forms.

Barring a few exact matches, one of the three common parameters (i.e., the RCRA hazardous waste codes, the waste form codes, or the quantities) are different between the WR and GM Forms for almost all of the manually matched waste streams. Even though the generator may have a better knowledge of their waste streams, for the final analysis of combusted wastes the information provided in the WR Forms on the three parameters will be used. This is because the receiver would be expected to determine the exact properties (and quantity) of the waste prior to treating the waste for several reasons including:

- to determine that right treatment system;

- to determine the exact price for treating the waste stream; and

- to avoid liability resulting from not treating the waste to LDR standards.

Note that several of the waste streams that were matched will be deleted for the final evaluation of combusted wastes. This is because the matching determined that these waste streams are not routinely-generated wastes (i.e., source codes were A61-A69 or origin codes were 2 or 5).

Exhibit 1: Groups of Form Codes That are Similar

The groups that were considered to be similar for the manual matching of the metal-bearing combusted wastes are listed below:

1) B20x and B219	2) B201 and B202
3) B201 and B203	4) B202 and B204
5) B203 and B204	6) B205 and B603
7) B301 and B401	8) B40x and B409

Similarly, the groups of similar form codes can be expanded to include:

9) B00x and B009	10) B1xx and B119
11) B103 and B105	12) B104 and B105
13) B106 and B110	14) B107 and B110
15) B108 and B110	16) B111 and B112
17) B205 and B206	18) B209 and B604
18) B206 and B603	19) B3xx and B319
20) B5xx and B519	21) B60x and B609

For a more detailed explantion of codes, see Appendix 2.

Exhibit 2: Top 50 Waste Streams in the WR Forms That Were Manually Matched to the GM Forms

OBS	Receiver's ID (WR/GM)	Generator's ID (WR/GM)	EPA Haz Codes (WR)	EPA Haz. Codes (GM)	Form Code (WR)	Form Code (GM)	SIC Code (GM)	Source Code (GM)	Origin Code (GM)	Quantity (WR) (short tons)	Quantity (GM) (short tons)
1	TXD083472266	TXD058265067	D001 D018 D035 F003	D001 D002	-	B207	2869	A35	1	36,916	45,800
2*	KSD031203318	MID980615298	D001 D005 D006 D007 D008 D018 D026 D035 F001 F002		B219					.348	
3*	ARD981512270	MID980615298	D001 D004 D005 D006 D007		B204					21,086	
4	PAD002389559	NJD002454544	F003 F005	D001 D035 D038 F003 F005	B219	B203	7389	A49	5	20,632	23,137
5*	VAD042755082	VAD098443443	D001 D018 D043 F001 F002 F003 F004 F005		B204					15,510	
6	MOD050232560	IND980590947	D001 F002 F003 F005	D001 F001 F003 F005	B202	B204	2869	A89	5	11,420	132
7*	MOD054018288	WID000808824	D001 F001 F002 F005		B204					10,929	
8	ARD981512270	TXD000742304	D001 D005 D006 D007 D008	F002-9 F019 K019 K030 K052 several U codes	B204	B203	7389	A89	1	10,883	10,892
9*	PAD002389559	NJD002182897	F003 F005		B219					10,016	
10	ARD981512270	LAD079464095	D001 D004 D005 D006 D007	D001 D004 D005 D006 D007	B204	B219	8999	A99	5	9,003	9,061
11	IND005081542	OHD005051826	D001 D007 D008 D018	D001 K048 K049 K051	B204	B205	2911	A89	1	8,565	8,494
12	MOD054018288	IND093219012	D001 D004 D007 D009 F001 F002 F003 F004 F005 K048	F001 F002 F003 F004 F005	B204	B204	9999	A99	5	7,416	7,113
13*	ARD981512270	ARD981057870	D001 D005 D006 D007 D008		B407					7,323	
14	KSD031203318	IND000646943	D001 D007 D008 D018 D022 D026 D027 D028 D033 D036	D001 D002 D005-8 D018 D019 D022 F001-5 K052	B219	B204	9999	A99	4	7,002	6,641

Exhibit 2: Top 50 Waste Streams in the WR Forms That Were Manually Matched to the GM Forms (continued)

OBS	Receiver's ID (WR/GM)	Generator's ID (WR/GM)	EPA Haz. Codes (WR)	EPA Haz Codes (GM)	Form Code (WR)	Form Code (GM)	SIC Code (GM)	Source Code (GM)	Origin Code (GM)	Quantity (WR) (short tons)	Quantity (GM) (short tons)
15*	PRD980526115	PRD981182421	F001 F002 F003 F005		B204					6,953	
16	LAD008161234	TXD008090409	D001 D028 F037 F038	K048 K049	B205	B603	2911	A89	1	6,785	7,164
17	IND072040348	IND005460209	D001 F003 F005	F008	B201	B203	2819	A49	5	6,774	8,065
18*	MOD050232560	MOD029729688	D001 D004 D005 D006 D007 D008 D009 D010 D011 D016		B202					6,591	
19	FLD000737312	GAD093380814	F001 F002 F003 F005	D001 D004 D006 D008 D011 F001-4 U's	B204	B204	2869	A89	5	6,442	640
20	ARD981512270	ARD981057870	D001 D005 D006 D007 D008	D001 D005-9 D026 D035 D040 F001-5 K027	B204	B219	9511	A99	5	6,346	5,230
21*	MOD054018288	IND984866541	D001 F003 F005		B204					6,065	
22*	MOD050232560	WID000808824	D001 F001 F002 F003 F005.		B202					5,126	
23*	FLD004059085	FLD000737312	D001 F001 F002 F003		B204					5,074	
24	ARD981512270	TXD046844700	D001 D004 D005 D006 D007	D004-20 F001-3 F005	B204	B204	7389	A73	5	4,936	5,180
25	MOD050232560	TND991279480	D001 D007 D008 F001 F002 F003 F005	D001	B202	-	9999	-	1	4,866	4,904
26	MOD050232560	OKD058078775	K048 K049 K051	K048 K049 K051	B202	B504	2911	A75	5	4,794	5,038
27	KSD031203318	TXD000742304	D001 D004 D005 D006 D007 D008 D009 D010 D016 F001	D002 D004-8 D010 F001-8 F019 K,P,U codes	B219	B207	7389	A71	1	4,743	194

Exhibit 2: Top 50 Waste Streams in the WR Forms That Were Manually Matched to the GM Forms (continued)

OBS	Receiver's ID (WR/GM)	Generator's ID (WR/GM)	EPA Haz. Codes (WR)	EPA Haz. Codes (GM)	Form Code (WR)	Form Code (GM)	SIC Code (GM)	Source Code (GM)	Origin Code (GM)	Quantity (WR) (short tons)	Quantity (GM) (short tons)
28	LAD981057706	ALD070513767	D001 D004 D005 D006 D007 D008 D010 D011 D018 D035	D001 F001-3 F005	B204	B204	2899	A89	1	4,531	6,961
29	IND005081542	IND980590947	D001 F001 F002 F003	D001 F001-3 F005	B204	B204	2869	A89	5	4,427	5,180
30	IND005081542	OHD004274031	D005 D006 D008 F001	D001 D005-8 D018 D035 D039 F001-3 F005	B204	-	4953	-	-	4,348	4,360
31*	SCD036275626	NCD991278276	D001		B403					4,320	
32	MOD050232560	ILD066918327	D001 D018 D035 F001 F002 F003 F005	D001 F001-3 F005	B202	B201	7389	A19	5	4,313	5,318
33	MOD054018288	ILD087157251	D001 F002 F003 F005	D001 F001-3 F005	B204	B204	4953	A89	5	4,297	4,245
34	LAD008161234	LAD000812818	D001 D035	D001 D035	B203	B219	2869	A35	1	4,001	3,866
35*	TXD006451090	LAD058530510	D008							3,844	
36*	IND005081542	OHD093945293	D001 D005 D006 D007		B204					3,775	
37	TXD981153711	TXD051161990	K051	K051		B603	2911	A89	1	3,687	4,098
38	IND005081542	OHD005046511	D001 D018 K048 K049	D001 K048 K049 K051	B204	-	2911	-	-	3,669	3,477
39	LAD981057706	TXD000742304	D001 D005 D006 D007 D008 F001 F002 F003 F004 F005	D002 D004-8 D010 F001-8 F019 K,P,U codes	B206	B207	7389	A71	1	3,518	2,611
40	ALD981020894	VAD065408692	D001 F003 F005	D001 D035 F003 F005	B403	B409	3053	A56	1	3,465	14
41	OHD004304689	WID059972935	D001 D005 D006 D007 D008 F003 F005	F003		B602	2821	A73	3	3,410	3,566

Exhibit 2: Top 50 Waste Streams in the WR Forms That Were Manually Matched to the GM Forms (continued)

OBS	Receiver's ID (WR/GM)	Generator's ID (WR/GM)	EPA Haz. Codes (WR)	EPA Haz. Codes (GM)	Form Code (WR)	Form Code (GM)	SIC Code (GM)	Source Code (GM)	Origin Code (GM)	Quantity (WR) (short tons)	Quantity (GM) (short tons)
42	MOD050232560	ILD005476882	K049	K049	B202	B603	2911	A75	3	3,316	3,469
43	IND005081542	OHD980700942	D001 D002 D005 D006	D001 D006-8 D018 D035 D039 D040 F001-3 F005	B204	B204	4953	-	-	3,296	2,377
44	KSD031203318	LAD000618256	D001 D005 D020 P004 P010 P018 P030 P041 P048 P050	D007 P001 P004-5 P010 P018 U,F,K codes	B407	B609	4953	A64	1	3,165	3,344
45	PAD002389559	PAD064375470	F003 F005	D001 D004-8 D010-11 F001-3 F005 organic D codes	B219	B204	4226	A89	5	3,127	2,722
46*	OHD981195779	OHD093945293	D001 D005 D006 D007 D008 D011 D022 D035 D039 F001							3,124	
47	VAD077942266	PAD064375470	D001 D004 D005 D006 D007 D010 D011 D018 D019 D021	D001 D004-8 D010-11 F001-3 F005 organic D codes	B204	B204	4226	A89	5	3,107	3,029
48*	IND005081542	OHD980681571	D001 F001 F003 F005		B204					3,057	
49*	KSD031203318	ARD981057870	D001 D005 D006 D007 D008 D009 D019 F001 F002 F003		B407					2,999	
50	ILD098642424	NJD986578953	F001 F002 U061	F001 F002 U036 U061 U129	B301	B401	4225	A66	2	2,900	1,869

Waste streams that could not be matched.

APPENDIX 4
DOCUMENTS USED AS SOURCES OF CONCENTRATION DATA

APPENDIX 4: SOURCES OF INFORMATION ON CONCENTRATIONS OF LISTED WASTES

- "Regulatory Impact Analysis of Restrictions on Land Disposal of Certain Solvent wastes," Office of Solid Waste, U.S. EPA, November 1986. Exhibit A-15 was used: this exhibit provides summarized information for all F001-F005 wastes that were incinerated in 1983.

- "Regulatory Impact Analysis of the Land Disposal Restrictions for Third Third Scheduled Wastes, Final Rule," Office of Solid Waste, U.S. EPA, April 25, 1990

- Listing Background Document for Petroleum Refining Wastes, August 15, 1988. This source only provides summarized information for the industry and does not provide waste-stream specific data; it was used for identifying constituents.

- Best Demonstrated Available Technology (BDAT) Background Documents. These included:

  BDAT Background Document for F001-F005 wastes (Final), June 15, 1989
  BDAT Background Document for F024 wastes (Final), May 15, 1989
  BDAT Background Document for F037/F038 wastes (Final), June 30, 1992
  BDAT Background Document for K002 wastes (Final), May 8, 1990
  BDAT Background Document for K013 wastes (Final), June 15, 1989
  BDAT Background Document for K016, K018, K019, and K020 wastes. (Final), August 15, 1988
  BDAT Background Document for K022 wastes (Final), August 15, 1990
  BDAT Background Document for K028 wastes (Final), May 25, 1989
  BDAT Background Document for K083 wastes (Final), May 8, 1990
  BDAT Background Document for P063 wastes (Final), June 15, 1989

- "Estimates of Waste Generation by the Organic Chemical Industry," Final Draft Report, U.S. EPA, December 7, 1987. This source was developed for the TC LDR RIA. It provides summarized information for the industry and does not provide waste-stream specific data.

- "Regulatory Impact Analysis: Proposed Standards for the Management of Used Oil," Office of Solid Waste, U.S. EPA, July 1985.

APPENDIX 5
RETRIEVAL FROM GENSUR

APPENDIX 5: RETRIEVAL FROM GENSUR

For each waste stream combination, the four key attributes (i.e., RCRA code, SIC code, source code, and form code) were used to match the BRS information to corresponding waste streams in the Generator Survey (GENSUR). The constituent and concentration information for these matched GENSUR waste streams were assumed to be appropriate for the BRS waste stream combination. The following presentation details the procedure and assumptions used for matching the information.

First, an attempt was made to exactly match all four elements of the unique BRS combination with corresponding GENSUR combinations. Exhibit 1 provides the correlation for matching the form codes in the BRS to the waste description codes in the GENSUR. Exhibit 2 provides the correlation for matching the source codes in the BRS to the source codes in the GENSUR.

For those combinations for which an exact match could not be found in the GENSUR, the following assumptions were used (in descending order) for matching the four elements. If the usage of an assumption resulted in more than one GENSUR match for a particular BRS waste stream combination then the constituent information was averaged across all the matches for that combination.

1) The RCRA codes exactly match and the BRS form code exactly matches the GENSUR waste description.

2) The RCRA codes exactly match and one or more of the other three elements exactly match.

3) 50 percent or more of the RCRA codes match and the form code exactly matches.

4) 50 percent or more of the RCRA codes match and one or more of the other elements exactly match.

5) The RCRA codes exactly match.

6) One or more of the RCRA codes match and the form code exactly matches.

7) Any three of the matching elements exactly match.

8) Any two of the matching elements exactly match.

The median of the constituent concentration range given in GENSUR was used as the concentration for a given constituent (e.g., a concentration range of 6 in the GENSUR would translate to an estimated concentration of 50,000 ppm). These medians were used for averaging the concentrations of a given constituent across the waste streams in which the constituent occurs. Concentrations were weighted by quantities of all waste streams (i.e., final concentration was estimated by assuming that all the matched waste streams are mixed together).

Exhibit 1: Form Codes for Top 200 Unique BRS Combinations

BRS Form Codes	Generator Survey - Waste Description Codes
B101	B01
B102	B02
B105	B05
B110	B10
B111	B11
B114	B14
B201	B58
B202	B59
B203	B60
B204	B61
B205	B62
B206	B63
B207	B64
B208	B65
B211	B68
B212	B69
B219	B70
B301	B36
B401	B80
B403	B82
B405	B84
B407	B89
B409	B90
B503	B21
B601	B71
B602	B72
B603	B73
B606	B76
B494, B597, B, blanks	B99

Exhibit 2: Source Codes for Top 200 Unique BRS Combinations

BRS Source Codes	Generator Survey - Source Codes
A09	S60
A19	S03, S07, S12
A31	S44
A32	S40
A33	S28
A34	S27
A35	S20
A36[1]	S15, S16, S26, S31-38, S48
A37[1]	S13-S16, S23, S25, S26, S30-S39, S41, S42, S45, S48
A49	S13-S16, S23, S25, S26, S29-S39, S41, S42, S45, S48
A54[1]	S78
A56	S61
A57	S49
A60[1]	S16, S25, S41, S45, S48
A71	S67
A73	S74
A74	S72
A75	S73
A89	S66, S69, S70, S71, S77
A92	S60, S62, S78
A99	S78

[1] There is a greater degree of uncertainty in these code translations. Please use these translations with a lesser degree of confidence as compared to the other code translations.

APPENDIX 6
WASTE CHARACTERIZATIONS FOR TOP 150 ROUTINELY GENERATED COMBUSTED WASTE STREAM COMBINATIONS

EPA reviewed the composition of the 150 largest-quantity wastestream combinations to identify the top 100 containing metals and/or halogenated organics. The following table provides the following information:

- each of the attributes that define a wastestream combination (i.e., RCRA code, SIC code, BRS source codes, BRS form code), and a check mark beside each that played a critical role in EPA's characterization of waste composition;
- the number of wastestreams comprising the combination;
- the number of facilities generating the wastestream combination;
- the constituents and concentrations present;
- the source of information for the characterization of constituents;
- a key noting the type of constituents present
  - "0" denotes that neither metals nor halogenated organics are present
  - "1" denotes the presence of metals
  - "2" denotes the presence of halogenated organics
  - "3" denotes the presence of both metals and halogenated organics;
- principal assumptions used in interpreting the data sources and assigning concentrations.

The information in this appendix is subject to a number of important caveats and limitations, as described in Chapter 2 of the accompanying report.

Appendix 6
Top 150 Routinely Generated Combusted Wastes: Constituent and Concentration Listing

RANK		RCRA waste code		SIC Code		Source Code		Form Code	Quantity	# WS	# Fac	Constituents	Conc. (ppm)	Constituent Source	Key	Assumptions
1	/	D001 D002 D008 D11?	/	2869		A33	/	B101	189,524	1	1	Acrylic acid	750	RCRA codes	1	First two constituents are ignitable and they are assumed to account for D001 Concentrations were based on judgement D002 characteristic assumed because of low concentrations of organic acids in liquid Concentration of acrylic acid based on a pH of 2 to satisfy D002 characteristic Assumption used for the Generator Survey match. RCRA codes and SIC code.
												Ethyl acrylate	50,000	RCRA codes		
												Acrolein	750	Gen. Survey		
												n-Butanol	50	Gen. Survey		
												Chromium	1	Gen. Survey		
												Formaldehyde	750	Gen. Survey		
												Maleic anhydride	50	Gen. Survey		
												Phthalic anhydride	50	Gen. Survey		
2	/	D002 D021 D028 F003 F005	/	2879		A37		B101	130,948	1	1	Methylene chloride	20,000	BRS CAS numbers	2	F003 code assumed due to methyl isobutyl ketone and F005 code assumed due to toluene. Average concentration for chlorobenzene from BDAT background documents for F001-F005. Concentrations for methylene chloride, ethylene dichloride, methyl isobutyl ketone, and toluene were based on judgement. Concentrations were adjusted so that total concentration of constituents was approximately 10 percent by weight for aqueous liquids. Hydrochloric acid added to constituents to account for D002 characteristic. Concentration of HCl based on a pH of 2 to satisfy D002 characteristic.
												Ethylene dichloride	10,000	BRS CAS numbers		
												Methyl isobutyl ketone	10,000	BRS CAS numbers		
												Toluene	2,000	BRS CAS numbers		
												Chlorobenzene	50,000	RCRA waste code		
												Hydrochloric acid	500	None		
3									128,207	444	344	No match			0	
4	/	D001 D002		2869		A35	/	B219	95,042	2	2	Methanol	50,000	Gen. Survey	3	Assumption used for the Generator Survey match: RCRA codes and form code.
												Methyl isobutyl ketone	30,000	Gen. Survey		
												Cyclohexanone	30,000	Gen. Survey		
												Ethyl acetate	30,000	Gen. Survey		
												Ethyl ether	30,000	Gen. Survey		
												Ethylene dichloride	30,000	Gen. Survey		
												Acetone	30,000	Gen. Survey		
												Acrylonitrile	30,000	Gen. Survey		
												Benzene	30,000	Gen. Survey		
												Phenol	1,500	Gen. Survey		
												Aniline	1,500	Gen. Survey		
												Benzal chloride	1,500	Gen. Survey		
												Benzo trichloride	1,500	Gen. Survey		
												Chloroform	1,500	Gen. Survey		
												Tetrachloroethylene	1,500	Gen. Survey		
												Toluene	1,500	Gen. Survey		
												1,4-Diethylene oxide	25	Gen. Survey		
												Carbon tetrachloride	10	Gen. Survey		
												Copper	2	Gen. Survey		
												Vanadium	0.002	Gen. Survey		
												Zinc	2	Gen. Survey		
												Hexachlorocyclopentadiene	10	Gen. Survey		
												Thallium	2	Gen. Survey		
												Nickel	5	Gen. Survey		
												Arsenic	0.01	Gen. Survey		
												Antimony	0.02	Gen. Survey		
												Barium	3	Gen. Survey		
												Beryllium	0.002	Gen. Survey		
												Cadmium	0.01	Gen. Survey		
												Chromium	0.05	Gen. Survey		
												Lead	1	Gen. Survey		
												Mercury	0.01	Gen. Survey		
												Selenium	0.05	Gen. Survey		
												Silver	0.01	Gen. Survey		

Appendix 6
Top 150 Routinely Generated Combusted Wastes: Constituent and Concentration Listing (continued)

RANK	RCRA waste code	SIC Code	Source Code	Form Code	Quantity	# WS	# Fac	Constituents	Conc. (ppm)	Constituent Source	Key	Assumptions
5				✓ B206	84,191	450	450	Xylene	3,300	Used Oil RIA	3	All constituents and concentrations were obtained from Table V 38, "Mean Concentrations of Potentially Hazardous Constituents in Used Oil Burned as On specification fuel," in the used oil RIA.
								Toluene	3,100	Used Oil RIA		
								1,1,1-Trichloroethane	1,200	Used Oil RIA		
								Benzene	1,100	Used Oil RIA		
								Tetrachloroethylene	900	Used Oil RIA		
								Trichlorotrifluoroethane	800	Used Oil RIA		
								Naphthalene	600	Used Oil RIA		
								Trichloroethylene	500	Used Oil RIA		
								Dichlorodifluoromethane	250	Used Oil RIA		
								Benzo(a)anthracene	20	Used Oil RIA		
								Benzo(a)pyrene	8	Used Oil RIA		
								Arsenic	10	Used Oil RIA		
								Barium	65	Used Oil RIA		
								Cadmium	5	Used Oil RIA		
								Chromium	30	Used Oil RIA		
								Lead	90	Used Oil RIA		
								Zinc	650	Used Oil RIA		
6	✓ D001 D002 D003 D018 D023 D024 D025 D026		2869	A32	✓ B110	64,265	2	1	Cresols	2,000	RCRA codes	0	D001 characteristic assumed from benzene and hydrogen sulfide was added to cover D003 characteristic. Concentrations for benzene and cresols are 200 times the regulatory levels. Hydrogen sulfide concentration was based on proposed EPA guidelines. Hydrochloric acid added to constituents to account for D002 characteristic. Concentration of HCl based on a pH of 2 to satisfy D002 characteristic.
								Benzene	100	RCRA codes		
								Hydrochloric acid	500	None		
								Hydrogen sulfide	500	None		
7	✓ D002	✓	2869	✓ A37	✓ B207	62,350	4	3	Acrylic acid	50,000	BRS CAS numbers	0	D002 characteristic assumed due to acrylic acid. Concentrations of acrylic acid and butyl acrylate were based on judgement.
								Butyl acrylate	50,000	BRS CAS numbers		
8	✓ D001 D018 D035 F003	✓	2869	✓ A57	✓ B219	54,912	1	1	Benzene	200,000	RCRA waste code	0	D001 characteristic and F003 code assumed due to benzene and methyl ethyl ketone. Concentrations were obtained from the Solvents LDR RIA.
								Methyl ethyl ketone	100,000	RCRA waste code		
9	✓ D001 D002 D003 F002 F020 F024 K017 K018 K020 K028		2821	A37	✓ B219	48,039	2	1	1,1-Dichloroethane	50,000	BDAT Back. Doc.	2	Constituents were obtained from the background document for K018, K020, K028, and F020. F002 code assumed due to 1,1,1-trichloroethane. Vinyl chloride was added to account for K020. Hydrochloric acid added to constituents to account for D002 characteristic and hydrogen sulfide added to account for D003 characteristic. Concentration of HCl based on a pH of 2 to satisfy D002 characteristic. Concentration of hydrogen sulfide was based on proposed EPA guidelines. Concentrations of the organics were based on judgement.
								Chloroethane	50,000	BDAT Back. Doc.		
								1,2-Dichloroethane	50,000	BDAT Back. Doc.		
								1,1,2-Trichloroethane	50,000	BDAT Back. Doc.		
								Trans 1,2-dichloroethene	50,000	BDAT Back. Doc.		
								1,1,1,2-Tetrachloroethane	50,000	BDAT Back. Doc.		
								1,1,2,2-Tetrachloroethane	50,000	BDAT Back. Doc.		
								1,1,1-Trichloroethane	50,000	BDAT Back. Doc.		
								Vinyl chloride	50,000	BDAT Back. Doc.		
								Toluene	50,000	BDAT Back. Doc.		
								Methanol	50,000	BDAT Back. Doc.		
								Tetrachlorobenzene	1,000	BDAT Back. Doc.		
								2,4,5-Trichlorophenol	1,000	BDAT Back. Doc.		
								2,3,7,8-Tetrachlorodibenzo(p)dioxin	10	BDAT Back. Doc.		
								Hydrochloric acid	500	None		
								Hydrogen sulfide	500	None		

Appendix 6
Top 150 Routinely Generated Combusted Wastes: Constituent and Concentration Listing (continued)

RANK		RCRA waste code		SIC Code		Source Code		Form Code	Quantity	# WS	# Fac	Constituents	Conc. (ppm)	Constituent Source	Key	Assumptions
10	/	D018 D038	/	2869		A34	/	B102	44,977	1	1	Pyridine	1,000	BRS CAS numbers	0	Constituent data taken from Table 3 of "Estimates of Waste Generation by the Organic Chemical Industry" of the TC LDR RIA Background Document assuming wastewater was derived from the production of pyridine (D038). Pyridine concentration was assumed to be 200 times the regulatory level. Concentration for ammonia was based on judgement.
												Ammonia	500	BRS CAS numbers		
												Benzene	250	BRS CAS numbers		
												Toluene	250	TC RIA Back		
												Cyanide	50	TC RIA Back		
11	/	D001 D002		2869		A33	/	B201	40,001	1	1	Methanol	100,000	BRS CAS numbers	0	D001 characteristic assumed from methanol and D002 characteristic assumed from hydrochloric acid. Methyl acetate was added since the BRS waste description suggested the presence of organic esters. Concentrations for methanol and methyl acetate were based on judgement. Concentration of HCl based on a pH of 2 to satisfy D002 characteristic. .
												Hydrochloric acid	500	BRS CAS numbers		
												Methyl acetate	10,000	None		
12	/	F002		2879		A35	/	B101	37,447	1	1	Methylene chloride	12,000	BRS CAS number	2	Assumed F002 code was due to methylene chloride alone. Concentration for methanol was obtained from the Generator Survey. Assumption used for the Generator Survey match: RCRA codes and form code.
13	/	D001 D018 D035 F003		2869		A35	/	B207	36,916	1	1	Benzene	200,000	RCRA waste code	0	D001 characteristic assumed from benzene and methyl ethyl ketone. Average concentrations of benzene and methyl ethyl ketone were obtained from the Solvents LDR RIA. All constituents (and concentrations) listed under F003 in the Solvents LDR RIA were included in this table. Since the form code indicates a concentrated aqueous solution of other organics, concentrations were based on judgement and their relative proportions as given in the Solvents LDR RIA.
												Methyl ethyl ketone	100,000	RCRA waste code		
												Xylene	30,000	Solvents LDR RIA		
												Acetone	50,000	Solvents LDR RIA		
												Ethyl acetate	50,000	Solvents LDR RIA		
												Ethylbenzene	25,000	Solvents LDR RIA		
												Ethyl ether	25,000	Solvents LDR RIA		
												Methyl isobutyl ketone	25,000	Solvents LDR RIA		
												n-Butanol	50,000	Solvents LDR RIA		
												Cyclohexanone	40,000	Solvents LDR RIA		
												Methanol	40,000	Solvents LDR RIA		
14	/	D001 D002 D007		2869		A33	/	B602	36,709	1	1	Chromium	1,000	RCRA waste code	1	Concentration for chromium was assumed to be 200 times the regulatory level. Hydrochloric acid added to constituents to account for D002 characteristic. Concentration of HCl based on a pH of 2 to satisfy D002 characteristic. Only constituents occurring in more than 33 percent of waste streams with D001 as the only RCRA code (as reported in the Generator Survey) were included to account for the D001 characteristic. For these constituents the median concentrations of the wastes in the Generator Survey were used.
												Toluene	50,000	Gen. Survey		
												Xylene	50,000	Gen. Survey		
												Lead	5	Gen. Survey		
												Cadmium	0.1	Gen. Survey		
												Hydrochloric acid	500	None		

Appendix 6
Top 150 Routinely Generated Combusted Wastes: Constituent and Concentration Listing (continued)

RANK		RCRA waste code		SIC Code		Source Code		Form Code	Quantity	# WS	# Fac	Constituents	Conc. (ppm)	Constituent Source	Key	Assumptions
15	/	D001 D002 F001 F005 K038 P094	/	2879		A37	/	B101	35,136	1	1	Toluene	40,000	BRS CAS numbers	2	D001 and D002 codes assumed from K038 constituents. P094 is phorate which is one of the constituents of K038. Average concentrations of constituents in spent solvents from production of cyclic esters and phosphoroamidothioate are used for F003 and F005. Concentration for methylene chloride was based on judgement. Hydrochloric acid added to constituents to account for D002 characteristic. Concentration of HCl based on a pH of 2 to satisfy D002 characteristic. Concentrations were adjusted so that total concentration of constituents was approximately 10 percent by weight for aqueous liquids.
												Methylene chloride	5,000	BRS CAS numbers		
												Ethyl acetate	20,000	F001-F005 Back		
												Xylene	20,000	Doc.		
												Phosphoroamidothioate	5,000	F001 F005 Back		
												Phorate	50	Doc.		
												Phosphorodithioic acid esters	5	F001-F005 Back		
												Formaldehyde	5	Doc.		
												Phosphorothioic acid esters	1	K038 BDAT Doc.		
												Hydrochloric acid	500	K038 BDAT Doc.		
														K038 BDAT Doc.		
														K038 BDAT Doc.		
														None		
16	/	D001	/	2869	/	A33	/	B219	32,779	18	17	Acetone	600,000	BRS CAS numbers	0	D001 characteristic assumed due to the organics. Concentrations for organics from the Generator Survey. Assumption used for the Generator Survey match: exact match on all data elements.
												Methanol	50,000	BRS CAS numbers		
												n-Butanol	50,000	BRS CAS numbers		
17	/	D001 D005 D006 D007 D008 D018 D026 D035 F001 F002					/	B219	31,348	1	1	Cresols	40,000	RCRA waste code	3	D001 characteristic assumed to be due to the organics denoted by the D codes. Concentrations of constituents indicated by the D codes were assumed to be 200 times the regulatory levels. All constituents included in the LDR RIA for F001 and F002 were added. Since the form code indicates unspecified organic liquids, concentrations were based on judgement and their relative proportions as given in the Solvents LDR RIA.
												Methyl ethyl ketone	40,000	RCRA waste code		
												Barium	20,000	RCRA waste code		
												Chromium	1,000	RCRA waste code		
												Lead	1,000	RCRA waste code		
												Cadmium	200	RCRA waste code		
												Benzene	100	RCRA waste code		
												Tetrachloroethylene	50,000	Solvents LDR RIA		
												Trichloroethylene	50,000	Solvents LDR RIA		
												Methylene chloride	50,000	Solvents LDR RIA		
												1,1,1-Trichloroethane	50,000	Solvents LDR RIA		
												Carbon tetrachloride	40,000	Solvents LDR RIA		
												Chlorobenzene	50,000	Solvents LDR RIA		
												1,2-Dichlorobenzene	40,000	Solvents LDR RIA		
												Trichlorofluoromethane	50,000	Solvents LDR RIA		
18	/	F002 F005	/	2834	/	A37	/	B101	28,640	1	1	Methylene chloride	1,000	BRS CAS numbers	2	F002 and F005 codes were assumed to be due to organics indicated by the BRS CAS numbers. Concentration for xylene was based on judgement. Concentrations for other constituents obtained from the Generator Survey. Assumption used for the Generator Survey match: RCRA codes and form code.
												Toluene	1,000	BRS CAS numbers		
												Xylene	1,000	BRS CAS numbers		
												Acetone	10	BRS CAS numbers		
												Methanol	1	BRS CAS numbers		
19	/	D001 D002 D003	/	2879		A37	/	B102	27,247	1	1	Acetyl chloride	50,000	Gen. Survey	3	Constituent information used for waste stream in the Generator Survey with the RCRA codes D001-D003 and the SIC code 2818 (Organic Pesticide Products). Hydrochloric acid added to constituents to account for D002 characteristic. Concentration of HCl based on a pH of 2 to satisfy D002 characteristic. Concentrations were adjusted so that total concentration of constituents was approximately 10 percent by weight for aqueous liquids.
												Ethylene dichloride	5,000	Gen. Survey		
												Dichloropropene	200	Gen. Survey		
												Chloroform	200	Gen. Survey		
												Methyl chloride	30	Gen. Survey		
												Carbon tetrachloride	30	Gen. Survey		
												Tetrachloroethane	30	Gen. Survey		
												Methylene chloride	30	Gen. Survey		
												Selenium	30	Gen. Survey		
												Hydrochloric acid	500	None		

Appendix 6
Top 150 Routinely Generated Combusted Wastes: Constituent and Concentration Listing (continued)

RANK		RCRA waste code		SIC Code		Source Code		Form Code	Quantity	# WS	# fac	Constituents	Conc. (ppm)	Constituent Source	Key	Assumptions
20	/	D001 D018 D019 D039 F024		2869	/	A74	/	B202	26,708	1	1	1,1,2 Trichloroethane 1,1,2,2 Tetrachloroethane Hexachloro 1,3 butadiene Benzene Carbon tetrachloride Tetrachloroethylene 1,2-Dichloroethane 1,1-Dichloroethane Hexachloroethane 3-Chloropropene Trans 1,3-dichloropropene 1,2-Dichloropropane 2-Chloro-1,3-butadiene Cis 1,3-dichloropropene	3,000 500 500 60 1,500 1,500 30,000 15,000 15,000 9,000 9,000 7,000 4,000 5,000	BRS CAS numbers BRS CAS numbers BRS CAS numbers RCRA code RCRA code RCRA code BDAT Back Doc BDAT Back. Doc. BDAT Back. Doc. BDAT Back. Doc. BDAT Back. Doc. BDAT Back. Doc. BDAT Back. Doc. BDAT Back. Doc.	2	Based on the BRS description, the waste was assumed to be 90 percent mixed heavy ends generated during the production of chlorinated hydrocarbons. The remaining 10 percent comprised of toxics are listed here. Concentrations represent midpoints of ranges indicated for constituents in untreated F024. The concentrations were adjusted so that the total organic concentration was approximately 10 percent
21	/	D001 F002 F003 F005	/	2833		A35		B101	26,284	1	1	Methanol Acetone Toluene Methylene chloride	30,000 30,000 20,000 15,000	BRS CAS numbers BRS CAS numbers BRS CAS numbers BRS CAS numbers	2	F002, F003, and F005 codes were assumed to be due to organics indicated by the BRS CAS numbers. Constituent concentration obtained from the Generator Survey and were adjusted so that total concentration of constituents was approximately 10 percent by weight for aqueous liquids. Assumption used for the Generator Survey match. RCRA codes and SIC code.
22	/	D001 D002 D003 D018 D026		2869		A35	/	B219	25,847	1	1	Benzene Cresols Hydrogen sulfide Hydrochloric acid	100,000 40,000 500 500	RCRA codes RCRA codes None None	0	D001 characteristic assumed from benzene and hydrogen sulfide was added to cover D003 characteristic. Concentration for benzene based on judgement, concentration for cresols was assumed to be 200 times the regulatory level, and concentration for hydrogen sulfide was based on proposed EPA guidelines. Hydrochloric acid added to constituents to account for D002 characteristic. Concentration of HCl based on a pH of 2 to satisfy D002 characteristic.
23	/	D001							25,371	223	178	Ethanol Epichlorohydrin 1,2-Dichloropropane 1,2,3-Trichloropropane Bis (2-chloroethyl) ether	50,000 50,000 10,000 10,000 10,000	BRS waste desc. BRS waste desc. K017 listing K017 listing K017 listing	2	Based on the BRS waste description, the waste was assumed to be a K017 waste (heavy ends from the purification column in the production of epichlorohydrin); all constituents for which K017 nonwastewaters is listed were added. Constituent concentrations were based on judgement.

Appendix 6
Top 150 Routinely Generated Combusted Wastes: Constituent and Concentration Listing (continued)

RANK	RCRA waste code	SIC Code	Source Code	Form Code	Quantity	# WS	# Fac	Constituents	Conc. (ppm)	Constituent Source	Key	Assumptions
4	/ K022	/ 2869	A33	/ B606	23,281	1	1	Phenol	3,000	BRS (A) number	1	Concentrations of all constituents were obtained from the Generator Survey. Assumption used for the Generator Survey match: RCRA codes and SIC code. Concentrations of the organics were adjusted to account for the form code that indicates organic sludges.
								Acenaphthalene	10,000	Gen. Survey		
								Acenaphthene	10,000	Gen. Survey		
								Anthracene	10,000	Gen. Survey		
								Diphenyl amine	10,000	Gen. Survey		
								Fluoranthene	10,000	Gen. Survey		
								Naphthalene	10,000	Gen. Survey		
								Ethylbenzene	5,000	Gen. Survey		
								Acetophenone	4,000	Gen. Survey		
								Acetone	2,500	Gen. Survey		
								Aniline	100	Gen. Survey		
								Styrene	15	Gen. Survey		
								Toluene	10	Gen. Survey		
								Xylene	15	Gen. Survey		
								Fluorene	1	Gen. Survey		
								Antimony	0.01	Gen. Survey		
								Arsenic	1	Gen. Survey		
								Barium	0.01	Gen. Survey		
								Beryllium	0.01	Gen. Survey		
								Cadmium	0.1	Gen. Survey		
								Chromium	0.2	Gen. Survey		
								Copper	0.01	Gen. Survey		
								Lead	0.01	Gen. Survey		
								Mercury	0.01	Gen. Survey		
								Nickel	0.1	Gen. Survey		
								Selenium	0.01	Gen. Survey		
								Silver	0.01	Gen. Survey		
								Thallium	0.01	Gen. Survey		
								Vanadium	0.001	Gen. Survey		
								Zinc	0.1	Gen. Survey		
25	/ D001 D004 D005 D006 D007			/ B204	22,251	3	3	Barium	20,000	RCRA codes	1	It was assumed that this waste stream combination is a mixture of D001 wastes and other wastes. Only constituents occurring in more than 33 percent of waste streams with D001 as the only RCRA code (as reported in the Generator Survey) were included to account for the D001 characteristic. For these constituents the median concentrations of the wastes in the Generator Survey were used. Concentrations for metals were assumed to be 200 times the regulatory levels. Assumed that no halogenated organic constituents were present in this waste although the form code indicates the potential presence of halogenated organics.
								Arsenic	1,000	RCRA codes		
								Chromium	1,000	RCRA codes		
								Cadmium	200	RCRA codes		
								Toluene	50,000	Gen. Survey		
								Xylene	50,000	Gen. Survey		
								Lead	1,000	Gen. Survey		

Appendix 6
Top 150 Routinely Generated Combusted Wastes: Constituent and Concentration Listing (continued)

RANK		RCRA waste code		SIC Code		Source Code		Form Code	Quantity	# WS	# Fac	Constituents	Conc. (ppm)	Constituent Source	Key	Assumptions
26	/	K048	/	2911	/	A75		B503	19,996	1	1	Xylene	50	Gen. Survey	1	Assumption used for the Generator Survey match. RCRA codes, SIC code, and source code.
												Naphthalene	250	Gen. Survey		
												Anthracene	20	Gen. Survey		
												Phenanthrene	50	Gen. Survey		
												Benz(c)acridine	20	Gen. Survey		
												Benzo(a)pyrene	5	Gen. Survey		
												Benzene	5	Gen. Survey		
												Bis (2-ethylhexyl) phthalate	20	Gen. Survey		
												Dimethyl phthalate	5	Gen. Survey		
												Ethylbenzene	5	Gen. Survey		
												Phenol	250	Gen. Survey		
												Chrysene	20	Gen. Survey		
												Cresols	5	Gen. Survey		
												Toluene	50	Gen. Survey		
												Pyrene	5	Gen. Survey		
												Antimony	1	Gen. Survey		
												Arsenic	5	Gen. Survey		
												Barium	20	Gen. Survey		
												Beryllium	0.5	Gen. Survey		
												Cadmium	1	Gen. Survey		
												Chromium	750	Gen. Survey		
												Copper	10	Gen. Survey		
												Lead	30	Gen. Survey		
												Mercury	0.2	Gen. Survey		
												Nickel	15	Gen. Survey		
												Selenium	1	Gen. Survey		
												Silver	0.5	Gen. Survey		
												Thallium	0.5	Gen. Survey		
												Vanadium	25	Gen. Survey		
												Zinc	50	Gen. Survey		
27	/	D001 D002 D003 D008 D018 D023 D024 D025 D026		2869		A33	/	B219	18,825	2	1	Cresols	50,000	RCRA waste code	1	D001 characteristic assumed due to benzene Hydrogen sulfide included to account for D003 characteristic. Concentration of hydrogen sulfide based on proposed EPA guidelines. Hydrochloric acid added to constituents to account for D002 characteristic. Concentration of HCl based on a pH of 2 to satisfy D002 characteristic. Concentration for lead was assumed to be 200 times the regulatory level and concentrations for benzene and cresols were based on judgement.
												Benzene	50,000	RCRA waste code		
												Lead	1,000	RCRA waste code		
												Hydrogen sulfide	500	None		
												Hydrochloric acid	500	None		
28	/	D001		2869		A33	/	B203	18,774	11	11	Methanol	500,000	BRS CAS numbers	0	D001 characteristic assumed due to organics. Concentrations for propanol and morpholine were based on judgement. Concentrations for the other constituents were obtained from the Generator Survey. Assumption used for the Generator Survey match: exact match on all data elements.
												Toluene	50,000	BRS CAS numbers		
												Butanol	125,000	BRS waste desc.		
												Propanol	50,000	BRS waste desc.		
												Morpholine	50,000	BRS waste desc.		

Appendix 6
Top 150 Routinely Generated Combusted Wastes: Constituent and Concentration Listing (continued)

RANK		RCRA waste code		SIC Code		Source Code		Form Code	Quantity	# WS	# fac	Constituents	Conc. (ppm)	Constituent Source	Key	Assumptions
29	/	D001 F002 F003 F005		2384	/	A37	/	B101	18,747	1	1	Methanol Acetone Methylene chloride Methyl isobutyl ketone n-Butanol Toluene Methyl ethyl ketone Benzene	25,000 25,000 8,000 4,000 1,500 30,000 2,000 750	BRS CAS numbers BRS CAS numbers BRS CAS numbers BRS CAS numbers BRS CAS numbers Gen. Survey Gen. Survey Gen. Survey	2	D001, F002, and F003 codes are assumed from organics indicated by the BRS CAS numbers. Benzene, methyl ethyl ketone, and toluene were obtained from the Generator Survey and used to account for F005 code. Concentrations of all constituents were obtained from the Generator Survey. Assumption used for the Generator Survey match: RCRA codes and source code. Concentrations were adjusted so that total concentration of constituents was approximately 10 percent by weight for aqueous liquids.
30	/	D001 D003 D018 P063		2869		A35	/	B212	18,603	1	1	Benzene Hydrocyanic acid	100,000 100	RCRA waste code RCRA waste code	0	D001 characteristic assumed due to benzene and D003 characteristic assumed due to hydrocyanic acid. Concentration for hydrocyanic acid obtained from P063 background document. Benzene concentration based on judgement.
31	/	D001 F002 F003	/	2831		A35	/	B101	18,154	1	1	Methylene chloride Methanol Acetone	75,000 10,000 10,000	BRS CAS numbers BRS CAS numbers BRS CAS numbers	2	All the D and F codes are assumed from organics indicated by the BRS CAS numbers. Concentrations were obtained from the Generator Survey and adjusted so that total concentrations of constituents was approximately 10 percent by weight for aqueous liquids. Assumption used for the Generator Survey match: RCRA codes and SIC code.
32	/	D001		2869		A33	/	B206	17,367	2	2	Toluene Methanol	30,000 50,000	BRS CAS numbers BRS CAS numbers	0	D001 characteristic assumed due to organics indicated by the CAS numbers. Concentrations were obtained from the Generator Survey. Assumption used for the Generator Survey match: RCRA codes and form code.
33	/	D018 D038 K022 K083		2865		A		B	17,303	1	1	Pyridine Benzene Acetophenone Phenol Aniline Diphenylamine Nitrobenzene Nickel	1,000 10 250,000 50,000 10 10 10 0.1	RCRA waste code RCRA waste code K022 back. doc. K022 back. doc. K083 back. doc. K083 back. doc. K083 back. doc. K083 back. doc.	1	Concentration of benzene and K022 constituents obtained from K022 BDAT background document; concentrations for K083 constituents obtained from K083 BDAT background document; Pyridine concentration assumed to be 200 times the regulatory level. Nonwastewater form was assumed based on descriptions of K022 and K083.

Appendix 6
Top 150 Routinely Generated Combusted Wastes: Constituent and Concentration Listing (continued)

RANK		RCRA waste code		SIC Code		Source Code		Form Code	Quantity	# WS	# Fac	Constituents	Conc. (ppm)	Constituent Source	Key	Assumptions
34	/	F003 F005					/	B219	17,218	12	12	Methyl ethyl ketone	300,000	Gen. Survey	3	Assumption used for the Generator Survey match. RCRA codes and form code concentration for barium was adjusted since the Generator Survey indicated an unrealistically high concentration for barium
												Acetone	125,000	Gen. Survey		
												Toluene	100,000	Gen. Survey		
												Ethyl acetate	90,000	Gen. Survey		
												Xylene	80,000	Gen. Survey		
												n-Butanol	10,000	Gen. Survey		
												Methyl isobutyl ketone	10,000	Gen. Survey		
												Ethylbenzene	1,000	Gen. Survey		
												Chlorobenzene	10	Gen. Survey		
												Arsenic	10,000	Gen. Survey		
												Barium	10,000	Gen. Survey		
												Chromium	10,000	Gen. Survey		
												Lead	10,000	Gen. Survey		
												Silver	10,000	Gen. Survey		
												Cadmium	1,000	Gen. Survey		
												Selenium	1,000	Gen. Survey		
												Mercury	150	Gen. Survey		
35	/	D001 D038 F002 F003 F005	/	2834		A37	/	B203	16,380	1	1	Methanol	350,000	BRS CAS numbers	0	All the D and F codes are assumed from organics indicated by the BRS CAS numbers. Concentrations were obtained from the background document for F001 F005 for the pharmaceuticals industry. The waste code F002 and form code B203 conflict since F002 indicates halogenated organics while B203 indicates only non-halogenated organics. Considering the constituents indicated by the BRS CAS numbers, the form code was assumed to be more accurate than the waste code. Since the form code indicates a solvent mixture, concentrations were adjusted so that total concentration would be approximately 1,000,000 ppm.
												Acetone	350,000	BRS CAS numbers		
												Acetonitrile	120,000	BRS CAS numbers		
												Toluene	120,000	BRS CAS numbers		
												Xylene	750	BRS CAS numbers		
												Pyridine	750	RCRA waste code		
36	/	D001 D002 D007		2869		A33	/	B219	16,099	2	2	Chromium	1,000	RCRA waste code	1	Concentration for vinyl acetate was based on judgement. Only constituents occurring in more than 33 percent of waste streams with D001 as the only RCRA code (as reported in the Generator Survey) were included to account for the D001 characteristic. For these constituents the median concentrations of the wastes in the Generator Survey were used. Concentration of chromium was assumed to be 200 times the regulatory level. Hydrochloric acid added to constituents to account for D002 characteristic. Concentration of HCl based on a pH of 2 to satisfy D002 characteristic.
												Vinyl acetate	50,000	BRS waste desc.		
												Toluene	50,000	Gen. Survey		
												Xylene	50,000	Gen. Survey		
												Lead	5	Gen. Survey		
												Cadmium	0.1	Gen. Survey		
												Hydrochloric acid	500	None		

Appendix 6
Top 150 Routinely Generated Combusted Wastes: Constituent and Concentration Listing (continued)

RANK		RCRA waste code		SIC Code		Source Code		Form Code	Quantity	# WS	# Fac	Constituents	Conc. (ppm)	Constituent Source	Key	Assumptions
37	/	D001 D002		2819		A37	/	B219	15,997	1	1	Methanol	50,000	Gen. Survey	3	D001 characteristic assumed due to the organics. Hydrochloric acid added to constituents to account for D002 characteristic. Concentration of HCl based on a pH of 2 to satisfy D002 characteristic. Assumption used for the Generator Survey match: RCRA codes and form code.
												Methyl isobutyl ketone	30,000	Gen. Survey		
												Acrylonitrile	30,000	Gen. Survey		
												Acetone	30,000	Gen. Survey		
												Benzene	30,000	Gen. Survey		
												Cyclohexanone	30,000	Gen. Survey		
												Ethyl acetate	30,000	Gen. Survey		
												Ethyl ether	30,000	Gen. Survey		
												Ethylene dichloride	30,000	Gen. Survey		
												Benzal chloride	1,500	Gen. Survey		
												Aniline	1,500	Gen. Survey		
												Benzo trichloride	1,500	Gen. Survey		
												Formaldehyde	300	Gen. Survey		
												Hexachlorocyclopentadiene	10	Gen. Survey		
												1,4-Diethylene oxide	25	Gen. Survey		
												Phenol	1,500	Gen. Survey		
												Tetrachloroethylene	1,500	Gen. Survey		
												Toluene	1,500	Gen. Survey		
												Antimony	0.02	Gen. Survey		
												Arsenic	0.01	Gen. Survey		
												Barium	5	Gen. Survey		
												Beryllium	0.002	Gen. Survey		
												Cadmium	0.01	Gen. Survey		
												Chromium	0.05	Gen. Survey		
												Copper	2	Gen. Survey		
												Lead	1	Gen. Survey		
												Mercury	0.01	Gen. Survey		
												Nickel	5	Gen. Survey		
												Selenium	0.04	Gen. Survey		
												Silver	0.01	Gen. Survey		
												Thallium	2	Gen. Survey		
												Hydrochloric acid	500	No		
38	/	D001 D018 D043 F001 F002 F003 F004 F005					/	B204	15,509	1	1	Benzene	100	RCRA waste code	2	D001 characteristic and F005 code assumed due to benzene. All constituents included in the LDR RIA were added. Concentrations for benzene and vinyl chloride were assumed to be 200 times the regulatory level. Since the form code indicates a solvent mixture, concentrations were adjusted so that total concentration would be approximately 1,000,000 ppm.
												Vinyl chloride	400	RCRA waste code		
												Cresols	100,000	Solvents LDR RIA		
												Nitrobenzene	100,000	Solvents LDR RIA		
												Tetrachloroethylene	50,000	Solvents LDR RIA		
												Trichloroethylene	50,000	Solvents LDR RIA		
												Methylene chloride	50,000	Solvents LDR RIA		
												1,1,1-Trichloroethane	50,000	Solvents LDR RIA		
												Carbon tetrachloride	40,000	Solvents LDR RIA		
												Chlorobenzene	50,000	Solvents LDR RIA		
												1,2-Dichlorobenzene	40,000	Solvents LDR RIA		
												Trichlorofluoromethane	50,000	Solvents LDR RIA		
												Xylene	30,000	Solvents LDR RIA		
												Acetone	50,000	Solvents LDR RIA		
												Ethyl acetate	50,000	Solvents LDR RIA		
												Ethylbenzene	25,000	Solvents LDR RIA		
												Ethyl ether	25,000	Solvents LDR RIA		
												Methyl isobutyl ketone	25,000	Solvents LDR RIA		
												n-Butanol	50,000	Solvents LDR RIA		
												Cyclohexanone	40,000	Solvents LDR RIA		
												Methanol	40,000	Solvents LDR RIA		

Appendix 6
Top 150 Routinely Generated Combusted Wastes: Constituent and Concentration Listing (continued)

RANK		RCRA waste code		SIC Code		Source Code		Form Code	Quantity	# WS	# Fac	Constituents	Conc. (ppm)	Constituent Source	Key	Assumptions
39	/	D001 F024		2819		A33	/	B219	14,893	1	1	1,3-Dichloropropylene 1,2-Dichloropropane Allyl chloride 1,2,3 Trichloropropane Acetone Benzene	175,000 150,000 100,000 50,000 10,000 1,000	BRS CAS numbers BRS CAS numbers BRS CAS numbers Gen. Survey F024 BDAT Doc. F024 BDAT Doc.	2	Concentrations for 1,3-dichloropropylene and 1,2,3 trichloropropane were obtained from the Generator Survey. Acetone and benzene were added from the F024 background document to account for the D001 characteristic. Concentrations for the other constituents are from the F024 Background Document, and are the midpoints of the possible concentration range for each constituent. Assumption used for the Generator Survey match: RCRA codes and form code.
40	/	D018 K022		2821		A33	/	B208	14,636	1	1	Benzene Acetophenone Phenol	50,000 750,000 150,000	BRS CAS numbers BDAT Back. Doc. BDAT Back. Doc.	0	Acetophenone and phenol concentrations were obtained from the K022 Background Document, and are the midpoints of the possible concentration range for these constituents, benzene concentration was based on judgement. The concentrations of the phenolics were adjusted since the form code indicates a concentrated phenolic liquid
41	/	D001 F001 F002 F003 F005 U001 U002 U003 U019 U028		2869		A33	/	B219	14,217	3	1	Acetaldehyde Acetone Acetonitrile Benzene Diethylhexyl phthalate Tetrachloroethylene Trichloroethylene Methylene chloride 1,1,1-Trichloroethane Carbon tetrachloride Chlorobenzene 1,2-Dichlorobenzene Trichlorofluoromethane	50,000 50,000 50,000 50,000 50,000 50,000 50,000 50,000 50,000 50,000 50,000 50,000 50,000	RCRA waste code RCRA waste code RCRA waste code RCRA waste code RCRA waste code Solvents LDR RIA Solvents LDR RIA Solvents LDR RIA Solvents LDR RIA Solvents LDR RIA Solvents LDR RIA Solvents LDR RIA Solvents LDR RIA	2	D001 characteristic assumed due to organics. F003 code assumed due to acetone and F005 code assumed due to benzene. All constituents included in the Solvents LDR RIA for F001 and F002 were added Concentrations for all constituents were based on judgement.
42	/	U001 D002 D003 D018 D026 D035 F002 F003 F004 F005		2869		A33	/	B219	14,194	2	1	Cresols Methyl ethyl ketone Benzene Tetrachloroethylene Methylene chloride Trichloroethylene Chlorobenzene 1,1,1-Trichloroethane 1,2-Dichlorobenzene Trichlorofluoromethane Hydrogen sulfide Hydrochloric acid	50,000 50,000 50,000 50,000 50,000 50,000 50,000 50,000 50,000 50,000 500 500	RCRA waste code RCRA waste code RCRA waste code Solvents LDR RIA Solvents LDR RIA Solvents LDR RIA Solvents LDR RIA Solvents LDR RIA Solvents LDR RIA Solvents LDR RIA None None	2	D001 characteristic assumed due to organics, F003 assumed due to methyl ethyl ketone, F004 assumed due to cresols, and F005 assumed due to benzene. Hydrochloric acid added to constituents to account for D002 characteristic. Concentration of HCl based on a pH of 2 to satisfy D002 characteristic. Hydrogen sulfide was added to account for D003 characteristic. The concentration for hydrogen sulfide was based on proposed EPA guidelines. All constituents included in the Solvents LDR RIA for F002 were added. Concentrations for organic constituents were based on judgment.
43	/	D002		2833		A34		B105	13,462	1	1	Sulfuric acid	500	BRS CAS numbers	0	Concentration of sulfuric acid based on a pH of 2 to satisfy D002 characteristic.

Appendix 6
Top 150 Routinely Generated Combusted Wastes: Constituent and Concentration Listing (continued)

RANK		RCRA waste code		SIC Code		Source Code		Form Code	Quantity	# WS	# Fac	Constituents	Conc. (ppm)	Constituent Source	Key	Assumptions
44	/	D001 D008		2821		A33	/	B602	13,395	1	1	Methyl methacrylate Lead	90,000 4,000	BRS CAS numbers RCRA waste code	1	D001 characteristic assumed from methyl methacrylate. Concentration for methyl methacrylate was obtained from the Generator Survey. Concentration for lead was adjusted since the Generator Survey indicated an unrealistically high concentration for lead. Assumption used for the Generator Survey match: RCRA codes and form code
45	/	D001 D002 D003 D004 D005 D006 D007 D008 D009 D010		2869		A33	/	B105	13,182	1	1	Arsenic Barium Cadmium Chromium Lead Mercury Selenium Toluene Xylene Hydrochloric acid Hydrogen sulfide	5 0.5 5 5 0.5 0.05 0.5 50,000 50,000 500 500	RCRA waste code RCRA waste code RCRA waste code RCRA waste code RCRA waste code RCRA waste code RCRA waste code Gen. Survey Gen. Survey None None	1	Only constituents occurring in more than 33 percent of waste streams with D001 as the only RCRA code (as reported in the Generator Survey) were included to account for the D001 characteristic. For the organics the median concentrations of the wastes in the Generator Survey were used. Hydrochloric acid added to constituents to account for D002 characteristic and hydrogen sulfide added to account for D003 characteristic. Concentration of HCl based on a pH of 2 to satisfy D002 characteristic. Concentrations of hydrogen sulfide were based on proposed EPA guidelines. Concentrations for metals were obtained from the Generator Survey. Assumption used for the Generator Survey match: RCRA codes.
46	/	K017 K019 K020		2869		A33	/	B601	13,073	1	1	Ethylene dichloride 1,1,2-Trichloroethane Tetrachloroethylene Tetrachloroethane Trichloroethylene 1-chloro, 2,3-epoxy propane	50,000 50,000 50,000 50,000 5,000 50	Gen. Survey Gen. Survey Gen. Survey Gen. Survey Gen. Survey Gen. Survey	2	Assumption used for the Generator Survey match: RCRA codes and form code. Concentrations for ethylene dichloride and 1,1,2-trichloroethane were adjusted since the Generator Survey indicated unrealistically high concentrations.
47	/	D001	/	2869	/	A35	/	B219	12,842	6	6	Methanol Isobutanol Acetone n-Butanol Methyl ethyl ketone Arsenic Barium Lead Chromium Cadmium Mercury Selenium Silver	900,000 50,000 750 50 50 0.05 0.05 0.5 0.5 0.05 0.05 0.5 0.5	Gen. Survey Gen. Survey Gen. Survey Gen. Survey Gen. Survey Gen. Survey Gen. Survey Gen. Survey Gen. Survey Gen. Survey Gen. Survey Gen. Survey Gen. Survey	1	Assumption used for the Generator Survey match: exact match on all data elements.
48	/	D001 F003	/	2833		A33	/	B203	11,772	2	2	Acetone Methanol	200,000 150,000	BRS CAS numbers BRS CAS numbers	0	D001 characteristic and F003 code were assumed to be due to organics indicated by the BRS CAS numbers. Constituent concentrations obtained from the Generator Survey. Assumption used for the Generator Survey match: RCRA codes and form code.

Appendix 6
Top 150 Routinely Generated Combusted Wastes: Constituent and Concentration Listing (continued)

RANK		RCRA waste code		SIC Code		Source Code		Form Code	Quantity	# WS	# Fac	Constituents	Conc. (ppm)	Constituent Source	Key	Assumptions
49	/	K027		2865		A33	/	B409	11,123	1	1	Ethylbenzene	10,000	Gen Survey	3	Assumption used for the Generator Survey match: RCRA codes. Concentrations for the organics were adjusted to account for the form code that indicates organic solids
												Toluene diisocyanate	10,000	Gen Survey		
												2,4 Toluene diamine	100,000	Gen. Survey		
												2,6 Toluene diamine	100,000	Gen. Survey		
												o-Dichlorobenzene	0.2	Gen. Survey		
												Nickel	2	Gen. Survey		
50	/	D001		2869		A37	/	B207	11,114	4	3	Diethyl sulfate	35,000	BRS CAS numbers	0	Acrylic acid assumed to account for D001 characteristic. Concentration of sulfuric acid based on a pH of 3 since this waste stream combination does not exhibit the D002 characteristic. Concentrations of other constituents based on judgement.
												Ethyl acrylate	35,000	BRS CAS numbers		
												Acrylic acid	35,000	BRS CAS numbers		
												Sulfuric acid	100	BRS CAS numbers		
51	/	D001 D002 F003	/	2834		A31	/	B101	10,976	1	1	Methanol	25,000	BRS CAS numbers	0	D001 characteristic assumed due to the organics, D002 characteristic assumed due to acetic acid and HCl, and F003 code assumed due to methanol. Constituent concentrations were based on judgement. Concentrations of acetic acid and HCl based on a pH of 2 to satisfy D002 characteristic.
												Cyclohexane	25,000	BRS CAS numbers		
												Isopropanol	25,000	BRS waste desc.		
												Acetone	25,000	BRS waste desc.		
												Acetic acid	600	BRS waste desc.		
												Hydrochloric acid	500	BRS waste desc.		
52	/	D001 F001 F002 F005					/	B204	10,929	2	2	Toluene	300,000	Gen. Survey	2	D001 characteristic assumed due to organics. Assumption used for the Generator Survey match: RCRA codes.
												Acrylonitrile	125,000	Gen. Survey		
												Methyl chloroform .	75,000	Gen. Survey		
												Acetone	10,000	Gen. Survey		
												Chlorobenzene	1,000	Gen. Survey		
												Cyclohexanone	1,000	Gen. Survey		
												4,4-methylene bis(2-chloroaniline)	900	Gen. Survey		
												Methylene chloride	10,000	Gen. Survey		
												Methyl ethyl ketone	10,000	Gen. Survey		
												Tetrachloroethylene	50,000	Gen. Survey		
												1,1,2-Trichloroethane	75,000	Gen. Survey		
												Trichloroethylene	35,000	Gen. Survey		
												Xylene	20,000	Gen. Survey		
53	/	D001 D005 D006 D007 D008		7389		A89	/	B204	10,883	1	1	Barium	20,000	RCRA waste code	1	Constituents from the Generator Survey that could account for the D001 characteristic were added. Concentrations for metals were assumed to be 200 times the regulatory level. Concentrations for organics were based on judgement. Assumption used for the Generator Survey match: RCRA codes. Assumed that no halogenated organic constituents were present in this waste although the form code indicates the potential presence of halogenated organics
												Cadmium	200	RCRA waste code		
												Chromium	1,000	RCRA waste code		
												Lead	1,000	RCRA waste code		
												Methyl ethyl ketone	50,000	Gen. Survey		
												Methyl isobutyl ketone	50,000	Gen. Survey		
												n-Butanol	50,000	Gen. Survey		
												Xylene	50,000	Gen. Survey		

Appendix 6
Top 150 Routinely Generated Combusted Wastes: Constituent and Concentration Listing (continued)

RANK		RCRA waste code		SIC Code		Source Code		Form Code	Quantity	# WS	# Fac	Constituents	Conc. (ppm)	Constituent Source	Key	Assumptions
54	/	D022	/	2869		A33	/	B219	10,846	1	1	Ethylbenzene	50,000	Gen Survey	1	Assumption used for the Generator Survey match. RCRA codes and SIC code.
												Acetophenone	40,000	Gen. Survey		
												Phenol	30,000	Gen. Survey		
												Acetone	25,000	Gen. Survey		
												Acenaphthalene	10	Gen. Survey		
												Acenaphthene	2	Gen. Survey		
												Aniline	100	Gen. Survey		
												Anthracene	10	Gen. Survey		
												Diphenyl amine	100	Gen. Survey		
												Fluoranthene	1	Gen. Survey		
												Fluorene	1	Gen. Survey		
												Naphthalene	50	Gen. Survey		
												Styrene	15	Gen. Survey		
												Toluene	10	Gen. Survey		
												Xylene	15	Gen. Survey		
												Antimony	01	Gen. Survey		
												Arsenic	1	Gen. Survey		
												Barium	0.01	Gen. Survey		
												Beryllium	0.01	Gen. Survey		
												Cadmium	0.1	Gen. Survey		
												Chromium	0.2	Gen. Survey		
												Copper	0.01	Gen. Survey		
												Lead	0.01	Gen. Survey		
												Mercury	0.01	Gen. Survey		
												Nickel	0.1	Gen. Survey		
												Selenium	0.01	Gen. Survey		
												Silver	0.01	Gen. Survey		
												Thallium	0.01	Gen. Survey		
												Vanadium	0.001	Gen. Survey		
												Zinc	0.1	Gen. Survey		
55	/	D001 F001 F002 F003					/	B204	10,782	8	8	Acetone	500,000	Gen. Survey	3	D001 characteristic assumed due to organics. Assumption used for the Generator Survey match: RCRA codes and form code. Since the form code indicates a solvent mixture, concentrations were adjusted so that total concentration would be approximately 1,000,000 ppm.
												Methylene chloride	220,000	Gen. Survey		
												1,1,1-Trichloroethane	60,000	Gen. Survey		
												Methyl chloroform	60,000	Gen. Survey		
												Trichlorotrifluoroethane	60,000	Gen. Survey		
												Selenium	50,000	Gen. Survey		
56	/	D001		2869		A35	/	B207	10,732	2	2	Toluene	50,000	Gen. Survey	1	Only constituents occurring in more than 5 percent of waste streams with D001 as the only RCRA code (as reported in the Generator Survey) were included to account for the D001 characteristic. For these constituents the median concentrations of the wastes in the Generator Survey were used. Concentrations of the organics were adjusted to account for the form code that indicates organic liquids.
												Xylene	50,000	Gen. Survey		
												Lead	5	Gen. Survey		
												Chromium	5	Gen. Survey		
												Cadmium	0.1	Gen. Survey		
57	/	D018 F037 F038 K048 K049 K050 K051		2911		A75	/	B603	10,580	1	1	Benzene	50,000	RCRA waste code K048-51 List. Doc.	1	Benzene assumed to account for all RCRA codes; lead and chromium were added based upon the K048 51 listing document. Concentrations of the metals were assumed to be 200 times the regulatory level. Benzene concentration was based on judgement.
												Lead	1,000	K048-51 List. Doc.		
												Chromium	1,000			

Appendix 6
Top 150 Routinely Generated Combusted Wastes: Constituent and Concentration Listing (continued)

RANK		RCRA waste code		SIC Code		Source Code		Form Code	Quantity	# WS	# Fac	Constituents	Conc. (ppm)	Constituent Source	Key	Assumptions
58	/	K022		2865		A33	/	B602	9,432	1	1	Acetone	50,000	BRS waste desc.	1	Concentration for acetone was based on judgement. Concentrations for the other constituents were obtained from the Generator Survey. Assumption used for the Generator Survey match: RCRA codes and form code.
												Phenol	50,000	Gen. Survey		
												Arsenic	5	Gen. Survey		
												Cadmium	0.5	Gen. Survey		
												Chromium	0.5	Gen. Survey		
59	/	D001 D011 D018 D021 D022		3861		A49	/	B204	9,390	2	1	Methanol	150,000	BRS CAS numbers	3	D001 characteristic assumed due to organics. Concentration for silver was assumed to be 200 times the regulatory level. Concentration for the other constituents were based on judgement with the consideration that the BRS waste description indicated that the waste is a bulk solvent waste from chemical manufacturing.
												Acetone	150,000	BRS CAS numbers		
												Toluene	150,000	BRS CAS numbers		
												Xylene	150,000	BRS CAS numbers		
												Methylene chloride	150,000	BRS CAS numbers		
												Chlorobenzene	20,000	RCRA waste code		
												Chloroform	20,000	RCRA waste code		
												Benzene	20,000	RCRA waste code		
												Silver	1,000	RCRA waste code		
60	/	D001 F003 F005					/	B204	8,747	15	15	Acetone	100,000	Gen. Survey	3	D001 characteristic assumed due to organics. Assumption used for the Generator Survey match: RCRA codes and form code.
												Methyl ethyl ketone	100,000	Gen. Survey		
												Toluene	100,000	Gen. Survey		
												Acetonitrile	10,000	Gen. Survey		
												Benzene	25,000	Gen. Survey		
												n-Butanol	3,000	Gen. Survey		
												Chloroform	10,000	Gen. Survey		
												Cyclohexanone	3,000	Gen. Survey		
												Dichlorobenzene	10,000	Gen. Survey		
												Ethyl ether	40,000	Gen. Survey		
												Methanol	65,000	Gen. Survey		
												Methyl chloroform	3,000	Gen. Survey		
												Methylene chloride	60,000	Gen. Survey		
												Methyl isobutyl ketone	50,000	Gen. Survey		
												Pyridine	4,000	Gen. Survey		
												Styrene	3,000	Gen. Survey		
												Tetrachloroethylene	6,000	Gen. Survey		
												Trichloroethylene	6,500	Gen. Survey		
												Xylene	50,000	Gen. Survey		
												Antimony	0.05	Gen. Survey		
												Arsenic	1	Gen. Survey		
												Barium	40	Gen. Survey		
												Beryllium	0.005	Gen. Survey		
												Cadmium	10	Gen. Survey		
												Chromium	3,000	Gen. Survey		
												Copper	50	Gen. Survey		
												Lead	3,000	Gen. Survey		
												Mercury	0.1	Gen. Survey		
												Nickel	1	Gen. Survey		
												Selenium	3,000	Gen. Survey		
												Silver	0.1	Gen. Survey		
												Thallium	0.05	Gen. Survey		
												Vanadium	0.05	Gen. Survey		
												Zinc	100	Gen. Survey		
61	/	D001 D007 D008 D018		2911		A89		B204	8,564	1	1	Benzene	50,000	RCRA waste code	1	D001 characteristic assumed due to benzene. Concentrations for chromium and lead were assumed to be 200 times the regulatory level. Benzene concentration was based on judgement. Assumed that no halogenated organic constituents were present in this waste although the form code indicates the potential presence of halogenated organics
												Chromium	1,000	RCRA waste code		
												Lead	1,000	RCRA waste code		

Appendix 6
Top 150 Routinely Generated Combusted Wastes: Constituent and Concentration Listing (continued)

RANK		RCRA waste code		SIC Code		Source Code		Form Code	Quantity	# WS	# Fac	Constituents	Conc (ppm)	Constituent Source	Key	Assumptions
62	/	D001 D018 D019 D022 D028		2869		A37	/	B202	8,416	1	1	Vinyl chloride Trichloroethylene Tetrachloroethylene Benzene Carbon tetrachloride Chloroform 1,2-Dichloroethane	100,000 100,000 100,000 100,000 100,000 100,000 100,000	BRS CAS numbers BRS CAS numbers BRS CAS numbers RCRA waste code RCRA waste code RCRA waste code RCRA waste code	2	D001 characteristic assumed due to organics. Constituent concentrations were based on judgement. For this waste stream combination, the concentrations were not assumed to be 200 times the regulatory level, since the total concentration with such an assumption was less than 3 percent which appears to be too low for organic liquids (as is indicated by the form code)
63	/	D001 D002 F003 F005	/	2834		A37	/	B101	8,326	1	1	Methanol Acetone Ethylene glycol Toluene Hydrochloric acid	25,000 25,000 25,000 10,000 500	BRS CAS numbers BRS CAS numbers BRS CAS numbers BRS CAS numbers None	0	All D and F codes were assumed to be due to organics indicated by the BRS CAS numbers. Constituent concentrations based on two waste streams in the background document for F001 F005, pharmaceuticals manufacturing, except for ethylene glycol, which was based on judgement. Hydrochloric acid added to constituents to account for D002 characteristic. Concentration of HCl based on a pH of 2 to satisfy D002 characteristic. Constituent concentrations were adjusted so that total constituent concentration was approximately 10 percent by weight for aqueous liquids.
64	/	D001		2821		A37	/	B206	8,274	2	2	Methanol Acetaldehyde Vinyl acetate Xylene Methyl methacrylate	5,000 5,000 5,000 5,000 5,000	BRS CAS numbers BRS CAS numbers BRS CAS numbers BRS CAS numbers BRS CAS numbers	0	D001 characteristic assumed due to organics. Concentration for methyl methacrylate obtained from the Generator Survey. Concentrations of all other constituents were based on judgement. Assumption used for the Generator Survey match: exact match on all data elements.
65	/	D002	/	2869	/	A09	/	B207	8,001	1	1	1,4-Diethylene oxide Hydrochloric acid Chromium Copper Nickel	100,000 3,100 300 10 60	Gen. Survey Third Third LDR RIA Third Third LDR RIA Third Third LDR RIA Third Third LDR RIA	1	Given the form code B207 (concentrated aqueous solution of other organics) in combination with the source code A09 (clean out of process equipment), information in the Third Third LDR RIA for D002 wastes with the waste form "spent acid with metals" was used. The only constituent provided by the Generator Survey was added Assumption used for the Generator Survey match: exact match on all data elements. Concentrations of the organics were adjusted to account for the form code that indicates organic liquids.
66	/	D004 F002 F005		2879		A09	/	B102	7,954	1	1	Ketocarbamate Toluene Xylene Arsenic	25,000 25,000 5,000 200	BRS CAS numbers BRS CAS numbers BRS CAS numbers RCRA waste code	0	F005 code assumed due to toluene. Organic constituent concentration were taken from the F001-F005 background document for the production of n-alkyl carbamate and ketocarbamate, and were adjusted so that total concentration of constituents was approximately 10 percent by weight for aqueous liquids. Arsenic concentration was assumed to be 200 times the regulatory level. Since the BRS CAS numbers did not indicate the presence of any F002 constituents, it was assumed that F002 code was an error.

Appendix 6
Top 150 Routinely Generated Combusted Wastes: Constituent and Concentration Listing (continued)

RANK		RCRA waste code		SIC Code		Source Code		Form Code	Quantity	# WS	# Fac	Constituents	Conc. (ppm)	Constituent Source	Key	Assumptions
67				3221	/	A84	/	B206	7,914	2	2	Xylene	500	Used Oil RIA	3	All constituents and concentrations were obtained from Table IV-15, "Concentration of Potentially Hazardous Constituents in Automotive Used Oil Samples Taken Directly from Generators," in the used oil RIA.
												Toluene	200	Used Oil RIA		
												Benzene	10	Used Oil RIA		
												Tetrachloroethylene	10	Used Oil RIA		
												Benzo(a)pyrene	10	Used Oil RIA		
												1,1,1-Trichloroethane	6	Used Oil RIA		
												Trichloroethylene	5	Used Oil RIA		
												Arsenic	5	Used Oil RIA		
												Barium	100	Used Oil RIA		
												Cadmium	1	Used Oil RIA		
												Chromium	8	Used Oil RIA		
												Lead	1,500	Used Oil RIA		
												Zinc	1,000	Used Oil RIA		
68	/	D001 D005 D006 D007 D008						/	B407	7,826	2	2	Barium	20,000	RCRA waste code	1	Constituents from the Generator Survey that could account for the D001 characteristic were added. Assumption used for the Generator Survey match: RCRA codes. Concentrations for metals were assumed to be 200 times the regulatory level. Concentrations for organics were based on judgement since 1) the Generator Survey indicated very low concentrations and 2) the form code indicates an organic solid.
												Cadmium	200	RCRA waste code		
												Chromium	1,000	RCRA waste code		
												Lead	1,000	RCRA waste code		
												Xylene	1,000	Gen. Survey		
												n-Butanol	1,000	Gen. Survey		
												Methyl isobutyl ketone	1,000	Gen. Survey		
69	/	D001 D002 D003 D018 D021 D023 D024 D025 D026 D035		2869		A33	/	B219	7,418	2	1	Methyl ethyl ketone	40,000	RCRA waste code	2	D001 characteristic assumed due to organics. Hydrogen sulfide included to account for D003 characteristic. Concentration of hydrogen sulfide based on proposed EPA guidelines. Hydrochloric acid added to constituents to account for D002 characteristic. Concentration of HCl based on a pH of 2 to satisfy D002 characteristic. Concentrations of other constituents were assumed to be 200 times the regulatory level.
												Cresols	40,000	RCRA waste code		
												Chlorobenzene	20,000	RCRA waste code		
												Benzene	100	RCRA waste code		
												Hydrogen sulfide	500	None		
												Hydrochloric acid	500	None		

Appendix 6
Top 150 Routinely Generated Combusted Wastes: Constituent and Concentration Listing (continued)

RANK		RCRA waste code		SIC Code		Source Code		Form Code	Quantity	# WS	# Fac	Constituents	Conc. (ppm)	Constituent Source	Key	Assumptions
70	/	D001 D002		2869		A33	/	B219	7,412	2	2	Methanol	50,000	Gen. Survey	3	Assumption used for the Generator Survey match. RCRA codes and form code. Hydrochloric acid added to constituents to account for D002 characteristic. Concentration of HCl based on a pH of 2 to satisfy D002 characteristic.
												Methyl isobutyl ketone	30,000	Gen. Survey		
												Acetone	30,000	Gen. Survey		
												Acrylonitrile	30,000	Gen. Survey		
												Benzene	30,000	Gen. Survey		
												Cyclohexanone	30,000	Gen. Survey		
												Ethyl acetate	30,000	Gen. Survey		
												Ethyl ether	30,000	Gen. Survey		
												Ethylene dichloride	30,000	Gen. Survey		
												Benzo trichloride	1,500	Gen. Survey		
												Benzal chloride	1,500	Gen. Survey		
												Chloroform	1,500	Gen. Survey		
												Phenol	1,500	Gen. Survey		
												Tetrachloroethylene	1,500	Gen. Survey		
												Toluene	1,500	Gen. Survey		
												Formaldehyde	100	Gen. Survey		
												Carbon tetrachloride	10	Gen. Survey		
												1,4-Diethylene oxide	25	Gen. Survey		
												Hexachlorocyclopentadiene	10	Gen. Survey		
												Antimony	0.02	Gen. Survey		
												Arsenic	0.01	Gen. Survey		
												Barium	5	Gen. Survey		
												Beryllium	0.002	Gen. Survey		
												Cadmium	0.02	Gen. Survey		
												Chromium	0.05	Gen. Survey		
												Copper	2	Gen. Survey		
												Lead	0.5	Gen. Survey		
												Mercury	0.01	Gen. Survey		
												Nickel	5	Gen. Survey		
												Selenium	0.05	Gen. Survey		
												Silver	0.01	Gen. Survey		
												Thallium	2	Gen. Survey		
												Vanadium	0.02	Gen. Survey		
												Zinc	2	Gen. Survey		
												Hydrochloric acid	500	None		
71	/	D001 D007 D008 D018 D022 D026 D027 D028 D033 D036		9999		A99	/	B219	7,001	1	1	Cresols	15,000	RCRA waste code	3	D001 characteristic assumed due to organics. Concentrations for metals were assumed to be 200 times the regulatory level. Concentrations for organics were based on judgement.
												1,4-Dichlorobenzene	15,000	RCRA waste code		
												Chloroform	15,000	RCRA waste code		
												Nitrobenzene	15,000	RCRA waste code		
												Benzene	15,000	RCRA waste code		
												1,2-Dichloroethane	15,000	RCRA waste code		
												Hexachloro 1,3-butadiene	15,000	RCRA waste code		
												Chromium	1,000	RCRA waste code		
												Lead	1,000	RCRA waste code		
72	/	D001 D018 D038 F003 F005		2869		A33	/	B602	6,993	1	1	Benzene	50,000	RCRA waste code	0	D001 characteristic assumed due to benzene and F005 assumed due to benzene and pyridine. All constituents included in the Solvents LDR RIA for F003 were added. Concentrations for all constituents were based on judgement.
												Pyridine	50,000	RCRA waste code		
												Acetone	10,000	Solvents LDR RIA		
												Ethyl acetate	10,000	Solvents LDR RIA		
												n-Butanol	10,000	Solvents LDR RIA		
												Cyclohexanone	10,000	Solvents LDR RIA		
												Methanol	10,000	Solvents LDR RIA		
												Xylene	10,000	Solvents LDR RIA		
												Ethylbenzene	10,000	Solvents LDR RIA		
												Ethyl ether	10,000	Solvents LDR RIA		
												Methyl isobutyl ketone	10,000	Solvents LDR RIA		

Appendix 6
Top 150 Routinely Generated Combusted Wastes: Constituent and Concentration Listing (continued)

RANK		RCRA waste code		SIC Code		Source Code		Form Code	Quantity	# WS	# Fac	Constituents	Conc. (ppm)	Constituent Source	Key	Assumptions
73	/	F001 F002 F003 F005					/	B204	6,975	4	4	Trichloroethylene	100,000	Gen. Survey	3	Assumption used for the Generator Survey match: RCRA codes and form code.
												Tetrachloroethylene	90,000	Gen. Survey		
												Xylene	75,000	Gen. Survey		
												Methylene chloride	65,000	Gen. Survey		
												Methanol	50,000	Gen. Survey		
												Methyl chloroform	35,000	Gen. Survey		
												Methyl ethyl ketone	20,000	Gen. Survey		
												Toluene	20,000	Gen. Survey		
												1,1,2-Trichloroethane	15,000	Gen. Survey		
												Trichlorofluoromethane	35,000	Gen. Survey		
												Acetone	35,000	Gen. Survey		
												Chloroform	15,000	Gen. Survey		
												Cyclohexanone	10,000	Gen. Survey		
												n-Butanol	5,000	Gen. Survey		
												Methyl isobutyl ketone	5,000	Gen. Survey		
												Phenol	1,000	Gen. Survey		
												o-Dichlorobenzene	1,000	Gen. Survey		
												Ethyl acetate	4,500	Gen. Survey		
												Ethylbenzene	4,500	Gen. Survey		
												Ethylene glycol monoethyl ether	4,000	Gen. Survey		
												Isobutanol	4,500	Gen. Survey		
												Benzene	0.05	Gen. Survey		
												Selenium	9,000	Gen. Survey		
												Antimony	0.005	Gen. Survey		
												Arsenic	0.02	Gen. Survey		
												Barium	5	Gen. Survey		
												Beryllium	0.005	Gen. Survey		
												Cadmium	0.5	Gen. Survey		
												Chromium	0.1	Gen. Survey		
												Copper	0.5	Gen. Survey		
												Lead	15	Gen. Survey		
												Mercury	0.01	Gen. Survey		
												Nickel	0.01	Gen. Survey		
												Silver	0.5	Gen. Survey		
												Thallium	0.005	Gen. Survey		
												Vanadium	0.005	Gen. Survey		
												Zinc	0.01	Gen. Survey		
74	/	D001 D002		/	2869	/	A37	/	B207	6,834	1	1	Acetaldehyde	5,000	BRS CAS numbers	0	D001 characteristic assumed due to organics. Hydrochloric acid added to constituents to account for D002 characteristic. Concentration of HCl based on a pH of 2 to satisfy D002 characteristic. Concentration of methyl ethyl ketone was obtained from the Generator Survey. Concentrations of other organic constituents were assumed to be equal to that of methyl ethyl ketone. Assumption used for the Generator Survey match: exact match on all data elements.
												Isobutyraldehyde	5,000	BRS CAS numbers		
												Methyl ethyl ketone	5,000	BRS CAS numbers		
												Hydrochloric acid	500	None		

Appendix 6
Top 150 Routinely Generated Combusted Wastes: Constituent and Concentration Listing (continued)

RANK		RCRA waste code	SIC Code		Source Code		Form Code	Quantity	# WS	# Fac	Constituents	Conc. (ppm)	Constituent Source	Key	Assumptions
75	√	D001 D028 F037 F038	2911	√	A89	√	B205	6,785	1	1	1,2-Dichloroethane	5,000	RCRA waste code	3	D001 characteristic assumed due to organics. Concentration for 1,2-dichloroethane was based on judgement. Constituent concentrations from the F037/38 Background Document, and are the midpoints of the possible concentration range for each constituent.
											Benzene	1,250	F037-38 BDAT Doc.		
											Toluene	1,000	F037-38 BDAT Doc.		
											Phenanthrene	300	F037-38 BDAT Doc.		
											Benzo(a)anthracene	100	F037-38 BDAT Doc.		
											Naphthalene	100	F037-38 BDAT Doc.		
											Pyrene	70	F037-38 BDAT Doc.		
											Chrysene	50	F037-38 BDAT Doc.		
											Benzo(a)pyrene	25	F037-38 BDAT Doc.		
											Dibenz(a,h)anthracene	20	F037-38 BDAT Doc.		
											Antimony	150	F037-38 BDAT Doc.		
											Arsenic	30	F037-38 BDAT Doc.		
											Barium	150	F037-38 BDAT Doc.		
											Cadmium	5	F037-38 BDAT Doc.		
											Chromium	2,500	F037-38 BDAT Doc.		
											Copper	500	F037-38 BDAT Doc.		
											Lead	850	F037-38 BDAT Doc.		
											Mercury	3	F037-38 BDAT Doc.		
											Nickel	40	F037-38 BDAT Doc.		
											Selenium	450	F037-38 BDAT Doc.		
											Silver	15	F037-38 BDAT Doc.		
											Vanadium	70	F037-38 BDAT Doc.		
											Zinc	2,000	F037-38 BDAT Doc.		
76	√	D001 D018 D025	2821		A33	√	B219	6,728	1	1	Cresols	50,000	RCRA waste code	0	D001 characteristic assumed due to benzene. Constituent concentrations were based on judgement.
											Benzene	50,000	RCRA waste code		
77	√	D003	2879		A32	√	B111	6,687	1	1	Hydrazine	50,000	BRS CAS numbers	0	D003 characteristic assumed due to hydrazine. Concentration of hydrazine obtained from the Generator Survey. Concentration of ammonia based on judgement. Assumption used for the Generator Survey match: exact match on all data elements.
											Ammonia	50,000	BRS CAS numbers		

Appendix 6
Top 150 Routinely Generated Combusted Wastes: Constituent and Concentration Listing (continued)

RANK		RCRA waste code		SIC Code		Source Code		Form Code	Quantity	# WS	# Fac	Constituents	Conc. (ppm)	Constituent Source	Key	Assumptions
78	√	D001 D004 D005 D006 D007 D008 D009 D010 D011 D016					√	B202	6,591	1	1	2,4 Dichlorophenoxyacetic acid	2,000	RCRA waste code	3	Only constituents occurring in more than 33 percent of waste streams with D001 as the only RCRA code (as reported in the Generator Survey) were included to account for the D001 characteristic. For toluene and xylene the median concentrations of the wastes in the Generator Survey were used. Concentrations of metals and 2,4-D (2,4-dichlorophenoxyacetic acid) were assumed to be 200 times the regulatory levels. The waste codes and form code B202 conflict since the waste codes do not indicate any halogenated organics while B202 indicates the presence of halogenated organics. The RCRA codes were assumed to be more accurate than the form code.
												Barium	20,000	RCRA waste code		
												Silver	1,000	RCRA waste code		
												Arsenic	1,000	RCRA waste code		
												Chromium	1,000	RCRA waste code		
												Lead	1,000	RCRA waste code		
												Cadmium	200	RCRA waste code		
												Selenium	200	RCRA waste code		
												Mercury	40	RCRA waste code		
												Toluene	50,000	Gen. Survey		
												Xylene	50,000	Gen. Survey		
79	√	K002		2865		A33		B203	6,554	1	1	Phenol	50,000	BRS CAS numbers	1	Metal constituent concentrations from K002 BDAT background document. Concentrations for the organics were based on judgement. Concentrations for lead and chromium were adjusted since the background document indicated unrealistically high concentrations.
												Cumyl phenol	50,000	BRS waste desc.		
												Acetophenone	50,000	BRS waste desc.		
												Lead	10,000	K002 BDAT Doc.		
												Chromium	10,000	K002 BDAT Doc.		
												Zinc	500	K002 BDAT Doc.		
												Barium	600	K002 BDAT Doc.		
80	√	D001 D002 D019 D022 D027 D028 D029 D032 D033 D034		2869		A99		B494	6,435	1	1	1,4-Dichlorobenzene	1,500	RCRA waste code	2	Waste description indicated that the waste is a PCB-contaminated organic waste. D001 characteristic assumed due to organics. Hydrochloric acid added to constituents to account for D002 characteristic. Concentration of HCl based on a pH of 2 to satisfy D002 characteristic. Concentration for PCBs was based on judgement. Concentrations for the other constituents were assumed to be 200 times the regulatory level.
												1,1-Dichloroethylene	1,400	RCRA waste code		
												Chloroform	1,200	RCRA waste code		
												Hexachloroethane	600	RCRA waste code		
												Carbon tetrachloride	100	RCRA waste code		
												1,2-Dichloroethane	100	RCRA waste code		
												Hexachlorobutadiene	100	RCRA waste code		
												Hexachlorobenzene	30	RCRA waste code		
												PCBs	10,000	BRS waste desc.		
												Hydrochloric acid	500	None		
81	√	F002 F003 F005	√	2384		A37	√	B101	6,414	1	1	Methanol	5	BRS CAS numbers	2	F003 and F005 codes assumed due to organics indicated by the BRS CAS numbers. Concentrations of these organics were obtained from the background document for F001-F005 for the fiber industry. Other constituents and concentrations obtained from the Generator Survey. Assumption used for the Generator Survey match: RCRA codes
												n-Butanol	5	BRS CAS numbers		
												Methyl ethyl ketone	20	BRS CAS numbers		
												Methylene chloride	1,500	Gen. Survey		
												Tetrachloroethylene	0.2	Gen. Survey		
												1,1,2-Trichloroethane	20	Gen. Survey		
82	√	D001 D018		2821		A33	√	B211	6,340	1	1	1,2,4-Trimethylbenzene	50,000	BRS CAS numbers	0	D001 characteristic assumed due to organics. Constituent concentrations for toluene and xylene obtained from the Generator Survey information on D001 wastes. Other constituent concentrations based on judgement.
												Ethylbenzene	50,000	BRS CAS numbers		
												Toluene	50,000	BRS CAS numbers		
												Xylene	50,000	BRS CAS numbers		
												Benzene	50,000	RCRA waste code		

Appendix 6
Top 150 Routinely Generated Combusted Wastes: Constituent and Concentration Listing (continued)

RANK		RCRA waste code		SIC Code		Source Code		Form Code	Quantity	# WS	# Fac	Constituents	Conc. (ppm)	Constituent Source	Key	Assumptions
83	/	K051		2911		A89	/	8601	6,217	2	2	Fluorene	250	Gen. Survey	1	Assumption used for the Generator Survey match: RCRA codes and form code.
												Naphthalene	250	Gen. Survey		
												Acenaphthalene	250	Gen. Survey		
												Toluene	75	Gen. Survey		
												Xylene	25	Gen. Survey		
												Phenanthrene	25	Gen. Survey		
												Anthracene	25	Gen. Survey		
												Benzene	25	Gen. Survey		
												Fluorine	15	Gen. Survey		
												Benz(c)acridine	5	Gen. Survey		
												Chrysene	5	Gen. Survey		
												Fluoranthene	5	Gen. Survey		
												Pyrene	5	Gen. Survey		
												Phenol	0.003	Gen. Survey		
												2,4-Dimethyl phenol	0.05	Gen. Survey		
												Ethylbenzene	0.05	Gen. Survey		
												Antimony	1	Gen. Survey		
												Arsenic	15	Gen. Survey		
												Barium	65	Gen. Survey		
												Beryllium	0.1	Gen. Survey		
												Cadmium	1	Gen. Survey		
												Chromium	750	Gen. Survey		
												Copper	30	Gen. Survey		
												Lead	4,700	Gen. Survey		
												Mercury	2	Gen. Survey		
												Nickel	40	Gen. Survey		
												Selenium	5	Gen. Survey		
												Silver	1	Gen. Survey		
												Thallium	0.05	Gen. Survey		
												Vanadium	30	Gen. Survey		
												Zinc	50	Gen. Survey		
84	/	F003 F005		2819		A		B	6,101	2	1	Methyl ethyl ketone	160,000	Gen. Survey	3	Assumption used for the Generator Survey match: RCRA codes and SIC code.
												Toluene	135,000	Gen. Survey		
												Xylene	110,000	Gen. Survey		
												Acetone	33,000	Gen. Survey		
												Benzene	14,000	Gen. Survey		
												n-Butanol	13,000	Gen. Survey		
												Carbon disulfide	4,000	Gen. Survey		
												Chloroform	4,000	Gen. Survey		
												Ethyl ether	7,500	Gen. Survey		
												Methanol	40,000	Gen. Survey		
												Antimony	0.05	Gen. Survey		
												Arsenic	1	Gen. Survey		
												Barium	0.5	Gen. Survey		
												Cadmium	0.1	Gen. Survey		
												Chromium	1	Gen. Survey		
												Lead	7,500	Gen. Survey		
												Mercury	0.1	Gen. Survey		
												Selenium	15,000	Gen. Survey		
												Zinc	5	Gen. Survey		

Appendix 6
Top 150 Routinely Generated Combusted Wastes: Constituent and Concentration Listing (continued)

RANK		RCRA waste code		SIC Code		Source Code		form Code		Quantity	# WS	# fac	Constituents	Conc. (ppm)	Constituent Source	Key	Assumptions
85	/	D001 D002 D003 D005 D018 D021 D023 D024 D025 D026		2869						6,075	1	1	Chlorobenzene	20,000	RCRA waste code	2	D001 characteristic assumed from benzene and chlorobenzene and hydrogen sulfide was added to cover D003 characteristic. Concentrations for benzene, chlorobenzene, and cresols are 200 times the regulatory levels. Hydrogen sulfide concentration was based on proposed EPA guidelines. Hydrochloric acid added to constituents to account for D002 characteristic. Concentration of HCl based on a pH of 2 to satisfy D002 characteristic.
													Cresols	2,000	RCRA waste code		
													Benzene	100	RCRA waste code		
													Hydrogen sulfide	500	None		
													Hydrochloric acid	500	None		
86	/	D001 F001 F003 F005						/	B204	5,956	8	8	Acetone	250,000	Gen. Survey	3	D001 characteristic assumed due to organics Assumption used for the Generator Survey match: RCRA codes and form code. Since the form code indicates a halogenated solvent mixture, concentrations were adjusted so that total concentration would be approximately 1,000,000 ppm.
													Methanol	140,000	Gen. Survey		
													Methyl ethyl ketone	140,000	Gen. Survey		
													Xylene	100,000	Gen. Survey		
													Toluene	80,000	Gen. Survey		
													Methyl chloroform	45,000	Gen. Survey		
													Methylene chloride	25,000	Gen. Survey		
													Methyl isobutyl ketone	15,000	Gen. Survey		
													Tetrachloroethylene	12,500	Gen. Survey		
													Carbon disulfide	12,500	Gen. Survey		
													Chlorobenzene	1,500	Gen. Survey		
													Chloroform	12,500	Gen. Survey		
													Ethyl acetate	12,500	Gen. Survey		
													Ethyl ether	12,500	Gen. Survey		
													1,1,2-Trichloroethane	0.3	Gen. Survey		
													n-Butanol	3	Gen. Survey		
													Isobutanol	0.3	Gen. Survey		
													Arsenic	0.3	Gen. Survey		
													Barium	15	Gen. Survey		
													Beryllium	0.3	Gen. Survey		
													Cadmium	0.3	Gen. Survey		
													Chromium	3	Gen. Survey		
													Copper	15	Gen. Survey		
													Lead	3	Gen. Survey		
													Mercury	0.3	Gen. Survey		
													Selenium	12,500	Gen. Survey		
													Silver	3	Gen. Survey		
													Zinc	15	Gen. Survey		

Appendix 6
Top 150 Routinely Generated Combusted Wastes: Constituent and Concentration Listing (continued)

RANK		RCRA waste code		SIC Code		Source Code		Form Code	Quantity	# WS	# Fac	Constituents	Conc. (ppm)	Constituent Source	Key	Assumptions
87	/	D001 F001 F002 F003 F005						/ B202	5,922	6	6	Tetrachloroethylene	50,000	Solvents LDR RIA	2	D001 characteristic assumed due to organics. All constituents included in the LDR RIA were added. The waste code F001 and F005 and form code B202 conflict since F003 and F005 both indicate non-halogenated organics while B202 indicates the presence of only halogenated organics. The RCRA codes were assumed to be more accurate than the form code. Since the form code indicates a solvent mixture, concentrations were adjusted so that total concentration would be less than 1,000,000 ppm.
												Trichloroethylene	50,000	Solvents LDR RIA		
												Methylene chloride	50,000	Solvents LDR RIA		
												1,1,1 Trichloroethane	50,000	Solvents LDR RIA		
												Carbon tetrachloride	40,000	Solvents LDR RIA		
												Chlorobenzene	50,000	Solvents LDR RIA		
												1,2 Dichlorobenzene	40,000	Solvents LDR RIA		
												Trichlorofluoromethane	50,000	Solvents LDR RIA		
												Xylene	30,000	Solvents LDR RIA		
												Acetone	50,000	Solvents LDR RIA		
												Ethyl acetate	50,000	Solvents LDR RIA		
												Ethylbenzene	25,000	Solvents LDR RIA		
												Ethyl ether	25,000	Solvents LDR RIA		
												Methyl isobutyl ketone	25,000	Solvents LDR RIA		
												n-Butanol	50,000	Solvents LDR RIA		
												Cyclohexanone	40,000	Solvents LDR RIA		
												Methanol	40,000	Solvents LDR RIA		
												Toluene	30,000	Solvents LDR RIA		
												Methyl ethyl ketone	25,000	Solvents LDR RIA		
												Isobutanol	30,000	Solvents LDR RIA		
												Pyridine	50,000	Solvents LDR RIA		
88	/	D001 F001 F002 F003		2899	/	A89	/	B204	5,825	2	1	Acetone	50,000	Gen. Survey	3	D001 characteristic assumed due to organics. Assumption used for the Generator Survey match: RCRA codes and form code.
												Methylene chloride	22,000	Gen. Survey		
												1,1,1-Trichloroethane	6,000	Gen. Survey		
												Methyl chloroform	6,000	Gen. Survey		
												Trichlorotrifluoroethane	6,000	Gen. Survey		
												Selenium	5,000	Gen. Survey		
89	/	D001 D018		2821		A37	/	B219	5,724	1	1	Naphthalene	50,000	BRS CAS numbers	0	D001 characteristic assumed due to organics. Constituent concentrations for benzene, toluene, and xylene obtained from the Generator Survey information on D001 wastes. Other constituent concentrations based on judgement.
												Cumene	50,000	BRS CAS numbers		
												Ethylbenzene	50,000	BRS CAS numbers		
												Toluene	50,000	BRS CAS numbers		
												Xylene	50,000	BRS CAS numbers		
												Benzene	50,000	RCRA waste code		

Appendix 6
Top 150 Routinely Generated Combusted Wastes: Constituent and Concentration Listing (continued)

RANK		RCRA waste code	SIC Code		Source Code		Form Code		Quantity	# WS	# Fac	Constituents	Conc. (ppm)	Constituent Source	Key	Assumptions
90	/	D001 F003 F005					/	B203	5,692	123	122	Toluene	135,000	Gen. Survey	3	D001 characteristic assumed due to organics . Assumption used for the Generator Survey match: RCRA codes and form code.
												Xylene	120,000	Gen. Survey		
												Methyl ethyl ketone	110,000	Gen. Survey		
												Acetone	65,000	Gen. Survey		
												Ethyl acetate	20,000	Gen. Survey		
												Methanol	55,000	Gen. Survey		
												Methyl chloride	55,000	Gen. Survey		
												Methyl isobutyl ketone	25,000	Gen. Survey		
												Methylene chloride	10,000	Gen. Survey		
												Acetonitrile	10,000	Gen. Survey		
												Chlorobenzene	10,000	Gen. Survey		
												Cyclohexanone	6,000	Gen. Survey		
												Ethylbenzene	5,000	Gen. Survey		
												n-Butanol	5,500	Gen. Survey		
												Ethylene glycol monoethyl ether	50	Gen. Survey		
												Acetophenone	0.1	Gen. Survey		
												Benzene	50	Gen. Survey		
												Formaldehyde	1	Gen. Survey		
												Isobutanol	1,500	Gen. Survey		
												Methyl chloroform	500	Gen. Survey		
												Naphthalene	4,000	Gen. Survey		
												Phenol	500	Gen. Survey		
												Pyridine	1,000	Gen. Survey		
												Arsenic	0.1	Gen. Survey		
												Barium	15	Gen. Survey		
												Beryllium	0.01	Gen. Survey		
												Cadmium	0.3	Gen. Survey		
												Chromium	60	Gen. Survey		
												Copper	10	Gen. Survey		
												Lead	8,000	Gen. Survey		
												Mercury	0.04	Gen. Survey		
												Nickel	2	Gen. Survey		
												Selenium	0.1	Gen. Survey		
												Silver	1,100	Gen. Survey		
												Thallium	0.006	Gen. Survey		
												Vanadium	4	Gen. Survey		
												Zinc	25	Gen. Survey		
91	/	D001 D002 D007 D008 D016 D035 F001 F003 F005 U009		2869		A37	/	B219	5,679	1	1	Acrylonitrile	5,000	RCRA waste code	3	D001 characteristic and F005 code assumed due to benzene and methyl ethyl ketone. All constituents included in the Solvents LDR RIA for F001 and F003 were added. Concentrations of organics were obtained from the LDR RIA. Concentrations of metals were assumed to be 200 times the regulatory level. Concentration of acrylonitrile was based on judgement. Hydrochloric acid added to constituents to account for D002 characteristic. Concentration of HCl based on a pH of 2 to satisfy D002 characteristic. Since the form code indicates unspecified organic liquids and the BRS waste description indicated that the waste is comprised on drainage, flushings, and washings, concentrations were based on judgement and their relative proportions as given in the Solvents LDR RIA.
												Benzene	4,000	RCRA waste code		
												Methyl ethyl ketone	3,000	RCRA waste code		
												Chromium	1,000	RCRA waste code		
												Lead	1,000	RCRA waste code		
												Tetrachloroethylene	5,000	Solvents LDR RIA		
												Trichloroethylene	5,000	Solvents LDR RIA		
												Methylene chloride	5,000	Solvents LDR RIA		
												1,1,1-Trichloroethane	5,000	Solvents LDR RIA		
												Carbon tetrachloride	4,500	Solvents LDR RIA		
												Xylene	4,000	Solvents LDR RIA		
												Acetone	5,000	Solvents LDR RIA		
												Ethyl acetate	5,000	Solvents LDR RIA		
												Ethylbenzene	3,000	Solvents LDR RIA		
												Ethyl ether	3,000	Solvents LDR RIA		
												Methyl isobutyl ketone	3,000	Solvents LDR RIA		
												n-Butanol	5,000	Solvents LDR RIA		
												Cyclohexanone	4,500	Solvents LDR RIA		
												Methanol	4,500	Solvents LDR RIA		
												Hydrochloric acid	500	None		

Appendix 6
Top 150 Routinely Generated Combusted Wastes: Constituent and Concentration Listing (continued)

RANK		RCRA waste code		SIC Code		Source Code		Form Code	Quantity	# WS	# Fac	Constituents	Conc. (ppm)	Constituent Source	Key	Assumptions
92	/	D001 D004 D005 D006 D007 D008 D009 D010 D011 D018					/	B202	5,565	5	5	Benzene	100,000	RCRA waste code	1	D001 characteristic assumed due to benzene Constituent concentrations for metals were assumed to be 200 times the regulatory level. Benzene concentration was based on judgement. For this waste stream combination, the organic concentrations given in the background document were not used because the total organic concentration was less than 3 percent which appears to be too low for organic liquids (as is indicated by the form code). The waste codes and form code B202 conflict since the waste codes do not indicate any halogenated organics while B202 indicates the presence of halogenated organics. The RCRA codes were assumed to be more accurate than the form code.
												Barium	20,000	RCRA waste code		
												Arsenic	1,000	RCRA waste code		
												Chromium	1,000	RCRA waste code		
												Lead	1,000	RCRA waste code		
												Silver	1,000	RCRA waste code		
												Cadmium	200	RCRA waste code		
												Selenium	200	RCRA waste code		
												Mercury	40	RCRA waste code		
93	/	D001 K013 U003		2869		A33	/	B219	5,554	1	1	Acetonitrile	100,000	RCRA waste code	1	D001 characteristic assumed due to acrylonitrile. For this waste stream combination, the organic concentrations given in the background document were not used because the total organic concentration was less than 1 percent which appears to be too low for organic liquids (as is indicated by the form code). Instead, concentrations of organics were based on judgement with the consideration that the BRS waste description indicated that the waste is an acetonitrile waste. Concentrations for the metals were obtained from the background document.
												Acrolein	25,000	K013 BDAT Doc.		
												Acrylamide	25,000	K013 BDAT Doc.		
												Acrylonitrile	25,000	K013 BDAT Doc.		
												Arsenic	0.02	K013 BDAT Doc.		
												Barium	0.03	K013 BDAT Doc.		
												Nickel	0.02	K013 BDAT Doc.		
												Lead	0.003	K013 BDAT Doc.		
												Zinc	0.02	K013 BDAT Doc.		
94	/	D001 U154		2869		A34	/	B203	5,479	1	1	Methanol	560,000	RCRA waste code	0	D001 characteristic assumed due to methanol. Methanol concentration was obtained from the Generator Survey. Assumption used for the Generator Survey match: RCRA codes and form code.
95	/	D008							5,357	46	42	Lead	1,000	RCRA waste code	1	Lead concentration was assumed to be 200 times the regulatory level.
96	/	D001 D002 F003		2819		A		B	5,323	2	1	Methanol	450,000	Gen. Survey	1	D001 characteristic assumed due to methanol. Hydrochloric acid added to constituents to account for D002 characteristic. Concentration of HCl based on a pH of 2 to satisfy D002 characteristic. All other concentrations were obtained from the Generator Survey. Assumption used for the Generator Survey match: RCRA codes.
												Acetone	45,000	Gen. Survey		
												Antimony	0.02	Gen. Survey		
												Arsenic	0.02	Gen. Survey		
												Barium	0.02	Gen. Survey		
												Beryllium	0.02	Gen. Survey		
												Cadmium	0.02	Gen. Survey		
												Chromium	2.2	Gen. Survey		
												Copper	0.02	Gen. Survey		
												Lead	0.02	Gen. Survey		
												Mercury	0.02	Gen. Survey		
												Nickel	0.02	Gen. Survey		
												Selenium	0.02	Gen. Survey		
												Silver	0.02	Gen. Survey		
												Thallium	0.02	Gen. Survey		
												Vanadium	0.02	Gen. Survey		
												Zinc	0.02	Gen. Survey		
												Hydrochloric acid	500	None		

Appendix 6
Top 150 Routinely Generated Combusted Wastes: Constituent and Concentration Listing (continued)

RANK		RCRA waste code		SIC Code		Source Code		Form Code	Quantity	# WS	# Fac	Constituents	Conc. (ppm)	Constituent Source	Key	Assumptions
97	✓	D001 D018		2869		A37	✓	B205	5,230	1	1	Benzene	100,000	RCRA waste code	0	D001 characteristic assumed due to benzene Benzene concentration was based on judgement
98	✓	D001 D008 F003 F005		4953	✓	A73	✓	B203	4,880	1	1	Lead	50,000	RCRA waste code	1	D001 characteristic assumed due to organics. Concentrations for all constituents were obtained form the Generator Survey. Assumption used for the Generator Survey match: RCRA codes and form code.
												Methyl ethyl ketone	90,000	Gen. Survey		
												Xylene	25,000	Gen. Survey		
												Toluene	25,000	Gen. Survey		
												Antimony	0.003	Gen. Survey		
												Arsenic	0.003	Gen. Survey		
												Barium	0.03	Gen. Survey		
												Beryllium	0.003	Gen. Survey		
												Cadmium	0.003	Gen. Survey		
												Chromium	0.3	Gen. Survey		
												Copper	0.3	Gen. Survey		
												Mercury	0.003	Gen. Survey		
												Nickel	0.3	Gen. Survey		
												Selenium	0.003	Gen. Survey		
												Silver	0.003	Gen. Survey		
												Thallium	0.003	Gen. Survey		
												Vanadium	0.003	Gen. Survey		
												Zinc	3	Gen Survey		
99	✓	D001 D007 D008 F001 F002 F003 F005		9999			✓	B202	4,866	1	1	Chromium	1,000	RCRA waste code	3	D001 characteristic assumed due to organics, F003 code assumed due to xylene, and F005 code assumed due to toluene. Concentrations for the metals were assumed to be 200 times the regulatory level. Assumption used for the Generator Survey match: RCRA codes. All organics listed under F001 and F002 were added from the F001-F005 background document. The concentrations for all organics were based on judgement. The waste code F003 and F005 and form code B202 conflict since F003 and F005 both indicate non-halogenated organics while B202 indicates the presence of only halogenated organics. The RCRA codes were assumed to be more accurate than the form code.
												Lead	1,000	RCRA waste code		
												Methyl chloroform	70,000	Gen. Survey		
												Toluene	70,000	Gen. Survey		
												Xylene	70,000	Gen. Survey		
												Tetrachloroethylene	70,000	F001-F005 BDAT Doc.		
												Trichloroethylene	70,000	F001-F005 BDAT Doc.		
												Methylene chloride	70,000	F001-F005 BDAT Doc.		
												1,1,1-Trichloroethane	70,000	F001-F005 BDAT Doc.		
												Carbon tetrachloride	70,000	F001-F005 BDAT Doc.		
												Chlorobenzene	70,000	F001-F005 BDAT Doc.		
												1,2-Dichlorobenzene	70,000	F001-F005 BDAT Doc.		
												Trichlorofluoromethane	70,000	F001-F005 BDAT Doc.		
100	✓	D001 D002	✓	2833		A37	✓	B101	4,830	1	1	Methanol	25,000	BRS CAS numbers	0	Organic constituents assumed to account for D001 characteristic, and acid constituents assumed to account for D002 characteristic. Concentrations of HCl and sulfuric acid based on a pH of 2 to satisfy D002 characteristic. Concentrations for isopropanol and ammonia were based on judgement. Concentrations for other constituents were obtained from the Generator Survey. Assumption used for the Generator Survey match: RCRA codes and form code.
												Acetone	25,000	BRS CAS numbers		
												Toluene	15,000	BRS CAS numbers		
												Hydrochloric acid	500	BRS CAS numbers		
												Sulfuric acid	500	BRS CAS numbers		
												Isopropanol	25,000	BRS waste desc.		
												Ammonia	1,000	BRS waste desc.		

Appendix 6
Top 150 Routinely Generated Combusted Wastes: Constituent and Concentration Listing (continued)

RANK		RCRA waste code	SIC Code	Source Code	Form Code	Quantity	# WS	# Fac	Constituents	Conc. (ppm)	Constituent Source	Key	Assumptions
101	/	F001 F002 F003				4,822	8	8	Acetone	50,000	Gen. Survey	3	The form code was assumed to be B204 (mixture of halogenated and non-halogenated solvents) based on the RCRA codes. Constituents and concentrations were obtained from waste stream combination under Rank 88
									Methylene chloride	22,000	Gen. Survey		
									1,1,1-Trichloroethane	6,000	Gen. Survey		
									Methyl chloroform	6,000	Gen. Survey		
									Trichlorotrifluoroethane	6,000	Gen. Survey		
									Selenium	5,000	Gen. Survey		
102	/	D001 D002 D007 D018 D021 F002 F003 F005	2865	A31	/ B204	4,781	2	1	Xylene	150,000	BRS CAS number	3	D001 code assumed due to organics, F002 code assumed due to chlorobenzene and 1,2-dichlorobenzene, F003 code was assumed due to xylene, and F005 code assumed due to benzene. Hydrochloric acid added to constituents to account for D002 characteristic. Concentration of HCl based on a pH of 2 to satisfy D002 characteristic. Concentration of chromium was assumed to be 200 times the regulatory level. Concentrations for all other constituents were based on judgement.
									Methanol	150,000	BRS CAS number		
									Benzene	150,000	BRS CAS number		
									1,2-Dichlorobenzene	150,000	BRS CAS number		
									Chlorobenzene	150,000	RCRA waste code		
									Chromium	1,000	RCRA waste code		
									Hydrochloric acid	500	None		
103	/	D001 D004 D005 D006 D007 D008 D009 D010 D016 F001	7389	A71	/ B219	4,743	1	1	Barium	20,000	RCRA waste code	3	All constituents for F001 were obtained from the Solvents LDR RIA. The concentrations for these organics were based on judgement since the form code unspecified organic liquids. Only constituents occurring in more than 33 percent of waste streams with D001 as the only RCRA code (as reported in the Generator Survey) were included to account for the D001 characteristic. For toluene and xylene the median concentrations of the wastes in the Generator Survey were used. The concentrations for the metals and 2,4 D were assumed to be 200 times the regulatory level.
									2,4-Dichlorophenoxy acetic acid	20,000	RCRA waste code		
									Arsenic	1,000	RCRA waste code		
									Lead	1,000	RCRA waste code		
									Chromium	1,000	RCRA waste code		
									Silver	1,000	RCRA waste code		
									Cadmium	200	RCRA waste code		
									Mercury	40	RCRA waste code		
									Tetrachloroethylene	50,000	Solvents LDR RIA		
									Trichloroethylene	50,000	Solvents LDR RIA		
									Methylene chloride	50,000	Solvents LDR RIA		
									1,1,1-Trichloroethane	50,000	Solvents LDR RIA		
									Carbon tetrachloride	50,000	Solvents LDR RIA		
									Toluene	50,000	Gen. Survey		
									Xylene	50,000	Gen. Survey		
104		D001 D018 D025	2911	A33	/ B219	4,694	1	1	Cresols	50,000	RCRA waste code	0	D001 characteristic assumed due to benzene Concentrations were based on judgement.
									Benzene	50,000	RCRA waste code		
									Pentane	50,000	BRS waste desc.		
105	/	K022	2865	A35	/ B602	4,609	1	1	Phenol	50,000	Gen. Survey	1	Assumption used for the Generator Survey match: RCRA codes and form code.
									Arsenic	5	Gen. Survey		
									Cadmium	0.5	Gen. Survey		
									Chromium	0.5	Gen. Survey		

Appendix 6
Top 150 Routinely Generated Combusted Wastes: Constituent and Concentration Listing (continued)

RANK		RCRA waste code		SIC Code		Source Code		Form Code	Quantity	# WS	# fac	Constituents	Conc. (ppm)	Constituent Source	Key	Assumptions
106	✓	D001 D002 D003 D004 D005 D006 D007 D008 D009 D010		4953		A99	✓	B114	4,564	1	1	Barium	20,000	RCRA waste code	1	Only constituents occurring in more than 33 percent of waste streams with D001 as the only RCRA code (as reported in the Generator Survey) were included to account for the D001 characteristic. For toluene and xylene the median concentrations of the wastes in the Generator Survey were used. The concentrations for the metals were assumed to be 200 times the regulatory level. Hydrochloric acid added to constituents to account for D002 characteristic. Concentration of HCl based on a pH of 2 to satisfy D002 characteristic. Hydrogen sulfide included to account for D003 characteristic. Concentration of hydrogen sulfide based on proposed EPA guidelines.
												Arsenic	1,000	RCRA waste code		
												Lead	1,000	RCRA waste code		
												Chromium	1,000	RCRA waste code		
												Silver	1,000	RCRA waste code		
												Cadmium	200	RCRA waste code		
												Mercury	40	RCRA waste code		
												Toluene	50,000	Gen. Survey		
												Xylene	50,000	Gen. Survey		
												Hydrochloric acid	500	None		
												Hydrogen sulfide	500	None		
107	✓	D001 D004 D005 D006 D007 D008 D010 D011 D018 D035		2899		A89	✓	B204	4,531	1	1	Methyl ethyl ketone	100,000	RCRA waste code	1	D001 characteristic assumed due to organics. Concentrations of metals were assumed to be 200 times the regulatory level. Concentration of methyl ethyl ketone was based on judgement.
												Barium	20,000	RCRA waste code		
												Benzene	2,200	RCRA waste code		
												Arsenic	1,000	RCRA waste code		
												Lead	1,000	RCRA waste code		
												Chromium	1,000	RCRA waste code		
												Silver	1,000	RCRA waste code		
												Cadmium	200	RCRA waste code		
												Selenium	200	RCRA waste code		
												Mercury	40	RCRA waste code		
108	✓	D001 D004 D005 D006 D007					✓	B407	4,509	4	4	Barium	20,000	RCRA waste code	1	Concentrations of metals were assumed to be 200 times the regulatory level. Only constituents occurring in more than 33 percent of waste streams with D001 as the only RCRA code (as reported in the Generator Survey) were included to account for the D001 characteristic. For lead, toluene, and xylene the median concentrations of the wastes in the Generator Survey were used.
												Arsenic	1,000	RCRA waste code		
												Chromium	1,000	RCRA waste code		
												Cadmium	200	RCRA waste code		
												Toluene	50,000	Gen. Survey		
												Xylene	50,000	Gen. Survey		
												Lead	5	Gen. Survey		
109	✓	D001		2869		A33	✓	B207	4,501	9	9	Formaldehyde	12,500	BRS CAS number	0	D001 characteristic assumed due to organics. Concentrations based on judgement.
												Methanol	12,500	BRS CAS number		
												Acetone	12,500	BRS CAS number		
												Acetonitrile	12,500	BRS CAS number		
												Acetaldehyde	12,500	BRS CAS number		
												n-Butanol	12,500	BRS CAS number		
												Ethylene glycol	12,500	BRS CAS number		
												Ethanol	12,500	BRS waste desc.		
110	✓	K027		2865		A33	✓	B403	4,457	1	1	Toluene-2,6-diisocyanate	20,000	BRS CAS number	3	Concentrations of all constituents were obtained from the Generator Survey. Assumption used for the Generator Survey match: RCRA codes. Concentrations of the organics were adjusted to account for the form code that indicates organic solids.
												Toluene-2,4-diisocyanate	20,000	BRS CAS number		
												Ethylbenzene	5,000	Gen. Survey		
												2,4-Toluene diamine	5	Gen. Survey		
												2,6-Toluene diamine	5	Gen. Survey		
												o-Dichlorobenzene	0.05	Gen. Survey		
												Nickel	2	Gen. Survey		

Appendix 6
Top 150 Routinely Generated Combusted Wastes: Constituent and Concentration Listing (continued)

RANK		RCRA waste code		SIC Code		Source Code		Form Code	Quantity	# WS	# Fac	Constituents	.Conc. (ppm)	Constituent Source	Key	Assumptions
111	/	D005 D006 D008 F001		4953			/	B204	4,348	1	1	Barium	20,000	RCRA waste code	3	All constituents (and concentrations) for F001 were obtained from the Solvents LDR RIA. The concentrations for the metals were assumed to be 200 times the regulatory level. Since the form code indicates a solvent mixture, concentrations of the organics were adjusted so that total concentration would be approximately 1,000,000 ppm
												Cadmium	200	RCRA waste code		
												Lead	1,000	RCRA waste code		
												1,1,1-Trichloroethane	240,000	Solvents LDR RIA		
												Methylene chloride	210,000	Solvents LDR RIA		
												Trichloroethylene	170,000	Solvents LDR RIA		
												Tetrachloroethylene	160,000	Solvents LDR RIA		
												Carbon tetrachloride	100,000	Solvents LDR RIA		
112	/	D001		2512		A92	/	B403	4,322	1	1	Styrene	45,000	Gen. Survey	3	Assumption used for the Generator Survey match: RCRA codes and form code.
												Toluene	17,000	Gen. Survey		
												Methyl ethyl ketone	12,000	Gen. Survey		
												Xylene	10,000	Gen. Survey		
												Tetrachloroethylene	7,000	Gen. Survey		
												n-Butanol	4,000	Gen. Survey		
												Ethylbenzene	2,500	Gen. Survey		
												Acetone	2,000	Gen. Survey		
												Cresols	2,000	Gen. Survey		
												Formaldehyde	1,500	Gen. Survey		
												Acrylonitrile	1,100	Gen. Survey		
												Methyl isobutyl ketone	1,000	Gen. Survey		
												Benzene	1	Gen. Survey		
												Bis (2-ethylhexyl) phthalate	1	Gen. Survey		
												Butyl benzyl phthalate	1	Gen. Survey		
												Chlorobenzene	1	Gen. Survey		
												Cyclohexanone	1	Gen. Survey		
												Ethyl acetate	600	Gen. Survey		
												Ethylene glycol monoethyl ether	500	Gen. Survey		
												Ethyleneimine	0.001	Gen. Survey		
												Ethylene oxide	10	Gen. Survey		
												Ethylidine dichloride	1	Gen. Survey		
												Fluoranthene	5	Gen. Survey		
												Isobutanol	50	Gen. Survey		
												Methanol	700	Gen. Survey		
												Methyl chloride	3	Gen. Survey		
												Methyl chloroform	3	Gen. Survey		
												Methylene chloride	1	Gen. Survey		
												Methyl methacrylate	600	Gen. Survey		
												Naphthalene	600	Gen. Survey		
												Octamethylpyrophosphoramide	500	Gen. Survey		
												Phenanthrene	0.1	Gen. Survey		
												Phenol	1,200	Gen. Survey		
												Antimony	1	Gen. Survey		
												Arsenic	4	Gen. Survey		
												Barium	2	Gen. Survey		
												Beryllium	0.02	Gen. Survey		
												Cadmium	1	Gen. Survey		
												Chromium	5	Gen. Survey		
												Copper	5	Gen. Survey		
												Lead	600	Gen. Survey		
												Mercury	0.3	Gen. Survey		
												Nickel	1.5	Gen. Survey		
												Selenium	0.1	Gen. Survey		
												Silver	0.1	Gen. Survey		
												Thallium	0.2	Gen. Survey		
												Vanadium	0.02	Gen. Survey		
												Zinc	10	Gen. Survey		

Appendix 6
Top 150 Routinely Generated Combusted Wastes: Constituent and Concentration Listing (continued)

RANK		RCRA waste code		SIC Code		Source Code		Form Code	Quantity	# WS	# Fac	Constituents	Conc. (ppm)	Constituent Source	Key	Assumptions
113	/	D001 D002 D007 D018 D021 F002 F003 F005		2865		A34	/	B204	4,316	1	1	Methanol Xylene Benzene 1,2-Dichlorobenzene Chlorobenzene Chromium Hydrochloric acid	100,000 100,000 100,000 100,000 2,000 1,000 500	BRS CAS number BRS CAS number BRS CAS number BRS CAS number RCRA waste code RCRA waste code None	3	D001 characteristic assumed due to organics, F002 code assumed due to 1,2-dichlorobenzene, F003 code assumed due to methanol, and F005 code assumed due to benzene. Concentration of chlorobenzene and chromium was assumed to be 200 times the regulatory level. Concentrations for the organics were based on judgement. Hydrochloric acid added to constituents to account for D002 characteristic. Concentration of HCl based on a pH of 2 to satisfy D002 characteristic.
114	/	D001 D018		2865		A		B	4,312	1	1	Benzene	100,000	RCRA waste code	0	D001 characteristic assumed due to benzene. Since the waste is combusted, it is assumed to be an organic liquid. Concentration was based on judgement.
115	/	D001 D002 D003 D035 U001 U002 U008 U028 U031 U057		5169		A31	/	B207	4,196	1	1	Methyl ethyl ketone Acetaldehyde Acetone Acrylic acid Diethylhexyl phthalate n-Butanol Cyclohexanone Hydrogen sulfide	10,000 10,000 10,000 10,000 10,000 10,000 10,000 500	RCRA waste code RCRA waste code RCRA waste code RCRA waste code RCRA waste code RCRA waste code RCRA waste code None	0	D001 characteristic assumed due to organics. Concentrations of the organics were based on judgement. Hydrogen sulfide was included to account for D003 characteristic. Concentration of hydrogen sulfide based on proposed EPA guidelines.
116	/	D001 D002 F002 F003 F005 U002 U012 U031 U044 U080		2834		A37	/	B201	4,163	1	1	Methanol Acetone Toluene Ethylene glycol n-Butanol Methylene chloride Aniline Chloroform	100,000 100,000 100,000 10,000 100,000 10,000 10,000 10,000	BRS CAS number BRS CAS number BRS CAS number BRS CAS number RCRA waste code RCRA waste code RCRA waste code RCRA waste code	2	D001 characteristic, F002, F003, and F005 codes assumed due to organics. Constituent concentrations were based on judgement with the consideration that the BRS waste description indicated that the waste contains primarily non-halogenated solvents.
117	/	D001 F003		2833		A49	/	B101	4,003	2	1	Xylene Acetone Ethyl acetate Acetonitrile Methanol	25,000 25,000 2,500 25,000 25,000	Gen. Survey Gen. Survey Gen. Survey Gen. Survey Gen. Survey	0	D001 assumed due to organics. Concentrations of all constituents obtained from the Generator Survey. Assumption used for the Generator Survey match: RCRA codes and form code.
118	/	D001 D035		2869		A35	/	B203	4,000	1	1	Methyl ethyl ketone	100,000	RCRA waste code	0	D001 characteristic assumed due to methyl ethyl ketone. Concentration based on judgement.

Appendix 6
Top 150 Routinely Generated Combusted Wastes: Constituent and Concentration Listing (continued)

RANK		RCRA waste code		SIC Code		Source Code		Form Code	Quantity	# WS	# Fac	Constituents	Conc. (ppm)	Constituent Source	Key	Assumptions
119	✓	D001 F004		2821		A33	✓	B602	3,990	1	1	Cresols	160,000	BRS CAS number	3	Concentration for 2,6-dimethyl phenol was based on judgement. Concentrations of all other constituents were obtained from the Generator Survey. Assumption used for the Generator Survey match: RCRA codes.
												2,6-Dimethyl phenol	50,000	BRS waste desc.		
												Nitrobenzene	140,000	Gen. Survey		
												Phenol	130,000	Gen. Survey		
												Xylene	120,000	Gen. Survey		
												Methylene chloride	30,000	Gen. Survey		
												Methyl isobutyl ketone	30,000	Gen. Survey		
												Toluene	10,000	Gen. Survey		
												Arsenic	0.1	Gen. Survey		
												Barium	10	Gen. Survey		
												Beryllium	8,000	Gen. Survey		
												Cadmium	0.1	Gen. Survey		
												Chromium	10	Gen. Survey		
												Copper	0.1	Gen. Survey		
												Lead	10	Gen. Survey		
												Mercury	01	Gen. Survey		
												Nickel	1	Gen. Survey		
												Selenium	0.1	Gen. Survey		
												Silver	0.1	Gen. Survey		
												Zinc	1	Gen. Survey		
120	✓	D001 F003		2869		A33	✓	B219	3,879	2	2	Xylene	50,000	BRS CAS number	0	D001 characteristic and F003 code assumed due to organics. Constituent concentrations were based on judgement with the consideration that the BRS waste description indicated that the waste is a mixture of terpenes containing small amounts of xylene.
												Ethylbenzene	10,000	BRS CAS number		
												Methanol	10,000	BRS CAS number		
												Limonene	100,000	BRS waste desc		
121	✓	D001 D002	✓	2869	✓	A31	✓	B207	3,873	1	1	Methanol	350,000	Gen. Survey	3	Assumption used for the Generator Survey match: exact match on all data elements. Hydrochloric acid added to constituents to account for D002 characteristic. Concentration of HCl based on a pH of 2 to satisfy D002 characteristic. Concentration for copper was adjusted since the Generator Survey indicated an unrealistically high concentration for copper.
												Copper	15,000	Gen. Survey		
												Hexachlorocyclopentadiene	5,000	Gen. Survey		
												Hydrochloric acid	500	None		
122	✓	D001 D002 D019 D032 D033 D034 D039 F002		2869		A33	✓	B219	3,866	2	1	Carbon tetrachloride	50,000	RCRA waste code	3	F002 code assumed due to tetrachloroethylene. Only constituents occurring in more than 33 percent of waste streams with D001 as the only RCRA code (as reported in the Generator Survey) were included to account for the D001 characteristic. For the metals the median concentrations of all the D001 wastes in the Generator Survey were used. The concentrations of all organics were based on judgement. Hydrochloric acid added to constituents to account for D002 characteristic. Concentration of HCl based on a pH of 2 to satisfy D002 characteristic.
												Hexachlorobenzene	50,000	RCRA waste code		
												Hexachlorobutadiene	50,000	RCRA waste code		
												Hexachloroethane	50,000	RCRA waste code		
												Tetrachloroethylene	50,000	RCRA waste code		
												Chloropyridine	150,000	BRS waste desc.		
												Toluene	50,000	Gen. Survey		
												Xylene	50,000	Gen. Survey		
												Lead	5	Gen. Survey		
												Chromium	5	Gen. Survey		
												Cadmium	0.1	Gen. Survey		
												Hydrochloric acid	500	None		
123	✓	D001		2865		A33	✓	B203	3,852	1	1	Acetone	80,000	BRS CAS number	0	D001 characteristic assumed due to organics. Constituent concentrations were based on judgement.
												Benzene	80,000	BRS CAS number		
												Cumene	80,000	BRS CAS number		
												Phenol	80,000	BRS CAS number		
												a Methyl styrene	80,000	BRS waste desc.		
												Ethylbenzene	80,000	BRS waste desc.		

Appendix 6
Top 150 Routinely Generated Combusted Wastes: Constituent and Concentration Listing (continued)

RANK		RCRA waste code	SIC Code	Source Code		Form Code	Quantity	# WS	# Fac	Constituents	Conc. (ppm)	Constituent Source	Key	Assumptions
124	/	D001 D005 D006 D007			/	B204	3,775	1	1	Barium Cadmium Chromium Toluene Xylene Lead	20,000 200 1,000 50,000 50,000 5	RCRA waste code RCRA waste code RCRA waste code Gen. Survey Gen. Survey Gen. Survey	1	Concentrations for metals indicated by the RCRA codes were assumed to be 200 times the regulatory level. Only constituents occurring in more than 33 percent of waste streams with D001 as the only RCRA code (as reported in the Generator Survey) were included to account for the D001 characteristic. For lead, toluene, and xylene the median concentrations of the wastes in the Generator Survey were used.
125	/	D002 D006		2833	/	A32	B207	3,724	1	1	Cadmium Selenium Hydrochloric acid	100,000 1 500	RCRA waste code Gen. Survey None	1	Concentrations for the metals were obtained from the Generator Survey. Assumption used for the Generator Survey match: RCRA codes and source code. Hydrochloric acid added to constituents to account for D002 characteristic. Concentration of HCl based on a pH of 2 to satisfy D002 characteristic. Though the form code indicates an organic liquid, no organics were added with the assumption that in this case the RCRA codes were more accurate than the form code.
126	/	D001 D018 K048 K049		2911			B204	3,669	1	1	Benzene Lead Chromium	100,000 1,000 1,000	RCRA waste code K048-51 List. Doc. K048-51 List. Doc.	1	Benzene assumed to account for all RCRA codes; lead and chromium were added based upon the K048-51 listing document. Concentrations of the metals were assumed to be 200 times the regulatory level. Benzene concentration was based on judgement. Assumed that no halogenated organic constituents were present in this waste although the form code indicates the potential presence of halogenated organics.
127	/	D018		2869		A33	B219	3,599	1	1	Benzene	100,000	RCRA waste code	0	Concentration based on judgement.
128	/	D001		2869		A89	B205	3,563	1	1	Methyl methacrylate	50,000	Gen. Survey	0	Assumption used for the Generator Survey match: RCRA codes and form code.
129	/	D001 D005 D006 D007 D008 F001 F002 F003 F004 F005		7389		A71	B206	3,518	1	1	Barium Cadmium Chromium Lead Xylene Toluene 1,1,1-Trichloroethane Benzene Tetrachloroethylene Trichlorotrifluoroethane Naphthalene Trichloroethylene Dichlorodifluoromethane Benzo(a)anthracene Benzo(a)pyrene Cresols Nitrobenzene	65 5 30 90 3,300 3,100 1,200 1,100 900 800 600 500 250 20 8 1,000 1,000	RCRA waste code RCRA waste code RCRA waste code RCRA waste code Used Oil RIA Used Oil RIA Used Oil RIA Used Oil RIA Used Oil RIA Used Oil RIA Used Oil RIA Used Oil RIA Used Oil RIA Used Oil RIA Used Oil RIA F001-F005 BDAT Doc. F001-F005 BDAT Doc.	3	D001 characteristic assumed due to organics. Cresols and nitrobenzene were added to account for the F004 code. The concentrations for these two organics were based on judgement. All the other organic constituents and concentrations were obtained from Table V-38, "Mean Concentrations of Potentially Hazardous Constituents in Used Oil Burned as On-specification fuel," in the used oil RIA These constituents were assumed to account for F001-F003 and F005 codes. Concentrations for metals were obtained from the used oil RIA.

Appendix 6
Top 150 Routinely Generated Combusted Wastes: Constituent and Concentration Listing (continued)

RANK		RCRA waste code		SIC Code		Source Code		Form Code	Quantity	# WS	# Fac	Constituents	Conc. (ppm)	Constituent Source	Key	Assumptions
130	/	D001 D002							3,477	12	10	Toluene Xylene Lead Chromium Cadmium Hydrochloric acid	50,000 50,000 5 5 0.1 500	Gen. Survey Gen Survey Gen Survey Gen. Survey Gen. Survey None	1	Only constituents occurring in more than 33 percent of waste streams with D001 as the only RCRA code (as reported in the Generator Survey) were included to account for the D001 characteristic. For these constituents the median concentrations of the wastes in the Generator Survey were used. Hydrochloric acid added to constituents to account for D002 characteristic. Concentration of HCl based on a pH of 2 to satisfy D002 characteristic.
131	/	D001 F003 F005		3053		A56	/	B4[illegible]	3,465	1	1	Xylene Toluene Methyl ethyl ketone Methyl isobutyl ketone Arsenic Barium Cadmium Chromium Copper Lead Mercury Nickel Selenium Silver Zinc	165,000 70,000 10,000 [illegible],000 0 1 0.1 0 1 0.1 0.1 125 0.01 0.1 0.1 0.1 0.1	Gen Survey Gen. Survey Gen. Survey Gen. Survey Gen. Survey Gen. Survey Gen. Survey Gen. Survey Gen. Survey Gen. Survey Gen. Survey Gen. Survey Gen. Survey Gen. Survey Gen. Survey	1	Assumption used for the Generator Survey match: RCRA codes and form code.
132	/	D001 D022		2869		A37	/	B202	3,414	1	1	Chloroform Lead Chromium Cadmium	100,000 5 5 0.1	BRS CAS number Gen. Survey Gen. Survey Gen. Survey	3	Only constituents occurring in more than 33 percent of waste streams with D001 as the only RCRA code (as reported in the Generator Survey) were included to account for the D001 characteristic. For the metals the median concentrations of the wastes in the Generator Survey were used. Since the form code indicates a halogenated solvent mixture, the non-halogenated organics included in the Generator Survey information on D001 wastes were not added. Chloroform concentration was based on judgement.
133	/	D001 D005 D006 D007 D008 F003 F005		2821	/	A73	/	B602	3,410	1	1	Barium Cadmium Chromium Lead Toluene Xylene	20,000 200 1,000 1,000 50,000 50,000	RCRA waste code RCRA waste code RCRA waste code RCRA waste code Gen. Survey Gen. Survey	1	D001 code assumed due to xylene, F003 code assumed due to xylene, and F005 code assumed due to toluene. Concentrations for metals were assumed to be 200 times the regulatory level. Concentrations of the organics were obtained from the Generator Survey. Assumption used for the Generator Survey match: RCRA codes.

Appendix 6
Top 150 Routinely Generated Combusted Wastes: Constituent and Concentration Listing (continued)

RANK		RCRA waste code	SIC Code		Source Code		Form Code		Quantity	# WS	# fac	Constituents	Conc. (ppm)	Constituent Source	Key	Assumptions
134	/	K048 K049 K051							3,393	3	3	Benz(c)acridine	100	Gen. Survey	1	Assumption used for the Generator Survey match: RCRA codes.
												Benzo(j)fluoranthene	100	Gen. Survey		
												Chrysene	400	Gen. Survey		
												Ethylbenzene	100	Gen. Survey		
												Fluoranthene	100	Gen. Survey		
												Naphthalene	150	Gen. Survey		
												Phenanthrene	250	Gen. Survey		
												Pyrene	150	Gen. Survey		
												Toluene	200	Gen. Survey		
												Xylene	250	Gen. Survey		
												Benzene	1	Gen. Survey		
												Arsenic	300	Gen. Survey		
												Barium	100	Gen. Survey		
												Beryllium	3	Gen. Survey		
												Cadmium	600	Gen. Survey		
												Chromium	400	Gen. Survey		
												Copper	300	Gen. Survey		
												Lead	300	Gen. Survey		
												Mercury	150	Gen. Survey		
												Nickel	300	Gen. Survey		
												Selenium	15	Gen. Survey		
												Silver	3	Gen. Survey		
												Thallium	0.1	Gen. Survey		
												Vanadium	100	Gen. Survey		
												Zinc	300	Gen. Survey		
135	/	K049	/	2911	/	A75		B202	3,316	1	1	Bis (2-ethylhexyl) phthalate	700	Gen. Survey	3	Assumption used for the Generator Survey match: RCRA codes, SIC code, and source code.
												Xylene	100	Gen. Survey		
												Phenanthrene	50	Gen. Survey		
												Toluene	50	Gen. Survey		
												Anthracene	10	Gen. Survey		
												Benzene	15	Gen. Survey		
												Benzo(a)pyrene	10	Gen. Survey		
												Butyl benzal phthalate	10	Gen. Survey		
												Chloroform	10	Gen. Survey		
												Chrysene	10	Gen. Survey		
												Ethylbenzene	10	Gen. Survey		
												Pyrene	10	Gen. Survey		
												Antimony	10	Gen. Survey		
												Arsenic	2	Gen. Survey		
												Barium	25	Gen. Survey		
												Beryllium	0.1	Gen. Survey		
												Cadmium	1	Gen. Survey		
												Chromium	1,700	Gen. Survey		
												Copper	.1	Gen. Survey		
												Lead	50	Gen. Survey		
												Mercury	1	Gen. Survey		
												Nickel	20	Gen. Survey		
												Selenium	0.2	Gen. Survey		
												Silver	0.1	Gen. Survey		
												Thallium	0.1	Gen. Survey		
												Vanadium	100	Gen. Survey		
												Zinc	50	Gen. Survey		

Appendix 6
Top 150 Routinely Generated Combusted Wastes: Constituent and Concentration Listing (continued)

RANK		RCRA waste code		SIC Code		Source Code		Form Code	Quantity	# WS	# Fac	Constituents	Conc. (ppm)	Constituent Source	Key	Assumptions
136	/	D001 D002 D005 D006		4953			/	8204	3,295	1	1	Barium	20,000	RCRA waste code	1	Concentrations for metals indicated by the D codes were assumed to 200 times the regulatory level. Only constituents occurring in more than 33 percent of waste streams with D001 as the only RCRA code (as reported in the Generator Survey) were included to account for the D001 characteristic. For these constituents the median concentrations of the wastes in the Generator Survey were used. Hydrochloric acid added to constituents to account for D002 characteristic. Concentration of HCl based on a pH of 2 to satisfy D002 characteristic. Assumed that no halogenated organic constituents were present in this waste although the form code indicates the potential presence of halogenated organics.
												Cadmium	200	RCRA waste code		
												Toluene	50,000	Gen. Survey		
												Xylene	50,000	Gen. Survey		
												Lead	5	Gen. Survey		
												Chromium	5	Gen. Survey		
												Hydrochloric acid	500	None		
137	/	D001	/	2869	/	A35	/	8606	3,175	1	1	Benzene	10,000	BRS waste desc.	2	Benzene was added since the BRS waste description indicated that the waste is burned for energy recovery and the Generator Survey indicated the presence of chlorobenzenes. Concentration for benzene was based on judgement. Concentrations for the other constituents were obtained from the Generator Survey. Assumption used for the Generator Survey match: exact match on all data elements.
												Chlorobenzene	5,000	Gen. Survey		
												o-Dichlorobenzene	300	Gen. Survey		
												p-Dichlorobenzene	300	Gen. Survey		
138	/	D001 D006 D008 F002					/	8403	3,168	2	2	Cadmium	200	RCRA waste code	3	Concentrations for metals were assumed to 200 times the regulatory level. Only constituents occurring in more than 33 percent of waste streams with D001 as the only RCRA code (as reported in the Generator Survey) were included to account for the D001 characteristic. For cadmium and lead the median concentrations of the wastes in the Generator Survey were used. Constituents included in the Solvents LDR RIA for F002 were added. Concentrations for the organics were based on judgement.
												Lead	1,000	RCRA waste code		
												Toluene	1,000	Gen. Survey		
												Xylene	1,000	Gen. Survey		
												Chlorobenzene	1,000	Solvents LDR RIA		
												Trichlorofluoromethane	1,000	Solvents LDR RIA		
												Trichloroethylene	1,000	Solvents LDR RIA		
												Tetrachloroethylene	1,000	Solvents LDR RIA		
												Methylene chloride	1,000	Solvents LDR RIA		
												1,1,1-Trichloroethane	1,000	Solvents LDR RIA		
												1,2-Dichlorobenzene	1,000	Solvents LDR RIA		
139	/	D019 D022 D032 D039 D043 K018 K020		2869		A33	/	8219	3,132	1	1	Chloroform	20,000	RCRA waste code	2	K018 code assumed due to hexachlorobenzene and K020 code assumed due to tetrachloroethylene. Concentrations for all constituents were based on judgement
												Tetrachloroethylene	20,000	RCRA waste code		
												Carbon tetrachloride	20,000	RCRA waste code		
												Vinyl chloride	20,000	RCRA waste code		
												Hexachlorobenzene	20,000	RCRA waste code		
												Ethylene dichloride	20,000	BRS waste desc.		
140	/	D001 D005 D006 D007 D008 D011 D022 D035 D039 F001							3,124	1	1	Methyl ethyl ketone	40,000	RCRA waste code	3	D001 characteristic assumed due to methyl ethyl ketone and F001 code assumed due to tetrachloroethylene. Concentrations for all constituents were assumed to be 200 times the regulatory level.
												Barium	20,000	RCRA waste code		
												Chromium	1,000	RCRA waste code		
												Lead	1,000	RCRA waste code		
												Silver	1,000	RCRA waste code		
												Chloroform	1,200	RCRA waste code		
												Cadmium	200	RCRA waste code		
												Tetrachloroethylene	140	RCRA waste code		

Appendix 6
Top 150 Routinely Generated Combusted Wastes: Constituent and Concentration Listing (continued)

RANK		RCRA waste code		SIC Code		Source Code		Form Code	Quantity	# WS	# Fac	Constituents	Conc. (ppm)	Constituent Source	Key	Assumptions
141	/	D001 F003 F005		2869		A09	/	B203	3,071	3	3	Toluene	250,000	BRS CAS number	0	F003 code assumed due to methanol and F005 code assumed due to toluene. Constituent concentrations were based on judgement.
												Methanol	250,000	BRS CAS number		
												Ethanol	250,000	BRS waste desc.		
142	/	D001		2822					3,068	1	1	Styrene	45,000	Gen. Survey	3	Assumption used for the Generator Survey match: RCRA codes and SIC code.
												Toluene	15,000	Gen. Survey		
												Methyl ethyl ketone	5,000	Gen. Survey		
												Carbon tetrachloride	4,000	Gen. Survey		
												1,1-Dichloroethylene	4,000	Gen. Survey		
												Xylene	1,500	Gen. Survey		
												Acrylonitrile	1,000	Gen. Survey		
												Chloroprene	1,000	Gen. Survey		
												1,4-Dichloro-2-butene	1,000	Gen. Survey		
												Ethyl acetate	1,000	Gen. Survey		
												Ethylbenzene	1,000	Gen. Survey		
												Methanol	2,500	Gen. Survey		
												Methyl chloride	1,000	Gen. Survey		
												Methylene chloride	1,000	Gen. Survey		
												Benzene	20	Gen. Survey		
												Antimony	0.5	Gen. Survey		
												Arsenic	0.05	Gen. Survey		
												Barium	0.5	Gen. Survey		
												Beryllium	0.05	Gen. Survey		
												Cadmium	0.3	Gen. Survey		
												Chromium	0.4	Gen. Survey		
												Copper	20	Gen. Survey		
												Lead	2	Gen. Survey		
												Mercury	0.2	Gen. Survey		
												Nickel	0.4	Gen. Survey		
												Selenium	0.04	Gen. Survey		
												Silver	20	Gen. Survey		
												Thallium	0.4	Gen. Survey		
												Vanadium	0.01	Gen. Survey		
												Zinc	0.01	Gen. Survey		
143	/	D018 D038		2869		A33	/	B606	3,060	1	1	Benzene	50,000	RCRA waste code	0	Constituent concentrations based on judgement.
												Pyridine	50,000	RCRA waste code		
144	/	D001 D005 D006 D007 D008 D009 D019 F001 F002 F003					/	B407	2,999	1	1	Barium	20,000	RCRA waste code	3	D001 assumed due to organics and F001 assumed due to carbon tetrachloride. Constituents given in the Solvents LDR RIA for F002 and F003 were added. Concentrations for metals were assumed to 200 times the regulatory level. Concentrations for other constituents were based on judgement.
												Chromium	1,000	RCRA waste code		
												Lead	1,000	RCRA waste code		
												Cadmium	200	RCRA waste code		
												Carbon tetrachloride	100	RCRA waste code		
												Mercury	40	RCRA waste code		
												Tetrachloroethylene	3,000	Solvents LDR RIA		
												Trichloroethylene	3,000	Solvents LDR RIA		
												Methylene chloride	3,000	Solvents LDR RIA		
												1,1,1-Trichloroethane	3,000	Solvents LDR RIA		
												Carbon tetrachloride	3,000	Solvents LDR RIA		
												Chlorobenzene	3,000	Solvents LDR RIA		
												1,2-Dichlorobenzene	3,000	Solvents LDR RIA		
												Trichlorofluoromethane	3,000	Solvents LDR RIA		
												Xylene	3,000	Solvents LDR RIA		
												Acetone	3,000	Solvents LDR RIA		
												Ethyl acetate	3,000	Solvents LDR RIA		
												Ethylbenzene	3,000	Solvents LDR RIA		
												Ethyl ether	3,000	Solvents LDR RIA		
												Methyl isobutyl ketone	3,000	Solvents LDR RIA		
												n-Butanol	3,000	Solvents LDR RIA		
												Cyclohexanone	3,000	Solvents LDR RIA		
												Methanol	3,000	Solvents LDR RIA		

Appendix 6
Top 150 Routinely Generated Combusted Wastes: Constituent and Concentration Listing (continued)

RANK		RCRA waste code		SIC Code		Source Code		Form Code	Quantity	# WS	# Fac	Constituents	Conc. (ppm)	Constituent Source	Key	Assumptions
145	/	D001 F001 F005		2869		A33	/	B204	2,976	2	1	Toluene	100,000	BRS CAS numbers	2	D001 characteristic assumed due to organics and F005 code assumed due to toluene. All constituents included in the Solvents LDR RIA for F001 were added. Concentrations for all constituents were based on judgement.
												2-Chloro-1,3-butadiene	100,000	BRS CAS numbers		
												Tetrachloroethylene	100,000	Solvents LDR RIA		
												Trichloroethylene	100,000	Solvents LDR RIA		
												Methylene chloride	100,000	Solvents LDR RIA		
												1,1,1-Trichloroethane	100,000	Solvents LDR RIA		
												Carbon tetrachloride	100,000	Solvents LDR RIA		
146	/	D001 D002		9999		A		B	2,969	2	1	Toluene	50,000	Gen. Survey	1	Only constituents occurring in more than 33 percent of waste streams with D001 as the only RCRA code (as reported in the Generator Survey) were included to account for the D001 characteristic. For these constituents the median concentrations of the wastes in the Generator Survey were used. Hydrochloric acid added to constituents to account for D002 characteristic. Concentration of HCl based on a pH of 2 to satisfy D002 characteristic.
												Xylene	50,000	Gen. Survey		
												Lead	5	Gen. Survey		
												Chromium	5	Gen. Survey		
												Cadmium	0.1	Gen. Survey		
												Hydrochloric acid	500	None		
147	/	D001 U154		2821		A37	/	B219	2,947	1	1	Methanol	500,000	BRS CAS numbers	0	D001 characteristic assumed due to methanol. Concentration for methanol obtained from the Generator Survey. Assumption used for the Generator Survey match: RCRA codes and form code. Concentration for isoheptane was based on judgement.
												Isoheptane	100,000	BRS waste desc.		
148	/	D001 D002 D003 D007 D018 D019 D021 D022 D028		2869		A33	/	B212	2,900	1	1	1,2-Dichloroethane	20,000	BRS CAS numbers	3	D001 characteristic assumed due to benzene. Concentration of chromium was assumed to be 200 times the regulatory level. Concentrations of the organics were based on judgement. Hydrochloric acid added to constituents to account for D002 characteristic. Concentration of HCl based on a pH of 2 to satisfy D002 characteristic. Hydrogen sulfide included to account for D003 characteristic. Concentration of hydrogen sulfide based on proposed EPA guidelines.
												Chlorobenzene	20,000	BRS CAS numbers		
												Benzene	20,000	RCRA waste code		
												Carbon tetrachloride	20,000	RCRA waste code		
												Chloroform	20,000	RCRA waste code		
												Chromium	1,000	RCRA waste code		
												Hydrochloric acid	500	None		
												Hydrogen sulfide	500	None		

Appendix 6
Top 150 Routinely Generated Combusted Wastes: Constituent and Concentration Listing (continued)

RANK		RCRA waste code		SIC Code		Source Code		Form Code	Quantity	# WS	# Fac	Constituents	Conc. (ppm)	Constituent Source	Key	Assumptions
149	/	D001 D002		2821		A49	/	B102	2,868	2	2	Ethylene glycol Toluene Xylene Lead Chromium Cadmium Ethyl acetate Hydrochloric acid	25,000 25,000 25,000 5 5 0.1 25,000 500	BRS CAS numbers Gen. Survey Gen. Survey Gen. Survey Gen. Survey Gen. Survey None None	1	Only constituents occurring in more than 33 percent of waste streams with D001 as the only RCRA code (as reported in the Generator Survey) were included to account for the D001 characteristic. For these constituents the median concentrations of the wastes in the Generator Survey were used. Hydrochloric acid added to constituents to account for D002 characteristic. Concentration of HCl based on a pH of 2 to satisfy D002 characteristic. Ethyl acetate was added since the BRS waste description indicated that the waste was generated from the manufacture of polyester resins. Concentrations for ethyl acetate and ethylene glycol were based on judgement Since the form code indicates an aqueous liquid, concentrations were adjusted so that total concentration would be approximately 100,000 ppm.
150	/	D002		2821		A33	/	B105	2,832	1	1	Hydrochloric acid	500	None	0	Hydrochloric acid was added to account for D002 characteristic. Concentration of HCl based on a pH of 2 to satisfy D002 characteristic.

APPENDIX 7
SUMMARY OF PRIORITIZATION SYSTEMS

Arizona Waste Minimization Project: Analysis of the Facility Annual Reports from the 53 Largest Hazardous Waste Generators in the State of Arizona (Task 2)[1]

Purpose of the Methodology/System

- Purpose of Arizona Waste Minimization Project is to allocate state's resources towards wastes and industries with the greatest potential to succeed at further waste minimization efforts.

- Purpose of Task 2 of the Project is to identify industries that generate the largest waste volumes, and wastes that are the most significant in terms of volume and toxicity.

System Description

- Grouped hazardous wastes from Arizona's 53 largest waste generators into 13 "waste categories" based on generating process, chemical composition, EPA hazardous waste number, physical form, and source codes.

- Assigned relative "toxicity" scores to waste categories reflecting "threat to ground-water resources" using a ranking system based primarily on professional judgment:

  - "1" = constituents would not migrate easily to ground water
  - "2" = corrosive wastes with high levels of soluble metals
  - "3" = wastes composed primarily of solvents

- Waste categories with large volumes and high relative toxicity scores were identified as being of highest priority for waste minimization (e.g., waste categories with volumes > 100,000 pounds and a toxicity score = 3 are classified as "high priority" for waste minimization).

- Report also examines proportion of waste already recycled for each industry and waste, and reduction in waste quantity between 1989 and 1990; information will be used in later tasks to identify industries and wastes that will benefit most from further waste minimization efforts.

System Evaluation

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[1] Documentation reviewed:

Arizona Waste Minimization Project: Analysis of the Facility Annual Reports from the 53 Largest Hazardous Waste Generators in the State of Arizona, August 1992, Report prepared for U.S. EPA Office of Waste Programs Enforcement by PRC Environmental Management, Inc.

Contact: William Wilson (415/744-2153)

Scope of coverage:

- Hazardous wastes generated by the 53 largest generators in Arizona, excluding:
  - Wastes generated by one-time incidents
  - Wastes coded as being generated by commercial TSDFs.

Media/pathways addressed:

- Ground water

Types of targeting criteria used (see Exhibit 1):

- Risk based:
  - Quantity of waste generated
  - Judged "threat to ground-water resources"
- Non-risk based:
  - Later tasks: potential to succeed at further waste minimization efforts (report indicates that this is related to proportion of waste already recycled)

Data requirements:

- Volume of waste generated
- Waste characteristics (chemical composition, physical form, source and generating process)
- Waste management practices (proportion currently recycled)
- Data derived from Facility Annual Reports (FARs) submitted to the Arizona Department of Environmental Quality by large quantity hazardous waste generators in Arizona.

Applicability to waste minimization targeting:

Pros

- Based on a small number of targeting criteria.
- Consideration (in subsequent tasks) of quantity of waste already recycled will avoid targeting industries that are already practicing effective waste minimization.

Cons

- Grouping wastes into categories and assigning toxicity scores relies on professional judgment; methods appear rudimentary and are not well documented. Furthermore, the "toxicity" score does not appear to be an accurate measure of the constituents inherent toxicity.

- At the national level, availability of data for grouping wastes and assigning toxicity scores will be limited.

- Addresses only ground water.

Exhibit 1. Targeting Criteria Used in the Arizona Waste Minimization Project

TARGETING CRITERIA	
Direct Risks	
Waste volume	✓
Waste/constituent toxicity Human toxicity Ecological toxicity	
Constituent concentration or mass	
Waste type (e.g., solvents)	✓
Number of generators	
Waste management practices (i.e., to determine if recycling is in practice)	✓
Releases to environmental media (only potential for release)	✓
Potential for constituent transport	✓
Potential for cross-media transfer	
Potential for human exposure: residential settings occupational settings	
Potential for ecological exposure	
Indirect or Acute Risks	
Ignitability, corrosivity, reactivity	
Ozone depletion potential	
Global warming	
Other Targeting Criteria	
Hazardous waste management capacity	
Technical/administrative feasibility	
Permitting/enforcement factors	
Cost savings	
Other factors Proportion of waste already recycled	✓

EPA/OPPT Chemical Use Clusters Scoring Methodology[2]

Purpose of the Methodology/System

- To provide a screening-level scoring/ranking of chemicals identified for a specific use cluster. (A chemical use cluster refers to a group of chemicals that are all associated with a specific process or function, be it chemical, industrial, or agricultural [e.g., vulcanizing agents in the rubber chemical production process, or pesticides for a specific crop].)
- To identify use clusters that may have high potential for pollution prevention.
- Applications identified in the documentation include:
  - -- "to systematically identify and screen concerns related to a greater number of chemicals in commerce;" and
  - -- "to provide an initial indication of potentially safer substitutes for extremely toxic chemicals."

System Description

- Two distinct components:
  - -- the first component scores chemicals within a single use cluster using five criteria
  - -- the second component scores the entire use cluster based on the chemical-specific scores and one additional criterion.
- Each of these six criteria includes one or more subcriteria which are scored based on chemical-specific data to form the basis of the numerical scores assigned to the criteria; the criteria and subcriteria are listed in Exhibit 1.
- Four scoring steps lead to the derivation of the overall chemical score:
  - -- based on chemical-specific data, each subcriterion is scored as high-, medium-, or low-concern, which translate into numeric scores of 3, 2, or 1.
  - -- the single highest subcriterion score is assigned to the criterion (e.g., human hazard potential) being scored. To minimize or "dampen" the effect of missing data, all subcriteria are regarded as equally important, i.e., equal weight, and the highest

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[2] Documentation reviewed:

Chemical Use Clusters Scoring Methodology, April 13, 1993 Draft Report, prepared by the Chemical Engineering Branch, Office of Pollution Prevention and Toxics, USEPA.

Contact: Daniel Fort (202/260-1694)

Exhibit 1: Criteria and Subcriteria

	Criteria	Subcriteria
Chemical-level	Human exposure potential	Chemical use volume Total TRI release Consumer use No. of workers No. of use sites Bioaccumulation Persistence
	Human hazard potential	Noncancer effects Cancer effects
	Ecological exposure potential	Chemical use volume Total TRI release Consumer use No. of use sites Bioaccumulation Persistence
	Ecological hazard potential	Aquatic toxicity
	EPA regulatory interest	*(No subcriteria)*
Cluster-level	Pollution prevention potential	Ecological risk reduction potential Human health risk reduction potential Chemical release reduction potential

score produced by any one subcriterion is assigned as the criterion score for the chemical.

- the scores of the two human risk-related criteria, i.e., human hazard potential and human exposure potential, are multiplied to obtain a score for a "secondary" criterion called the chemical human risk reduction potential.

- similarly, a score is obtained for another secondary criterion, the chemical ecological risk reduction potential.

- the overall chemical score is calculated as the sum of a chemical's scores for the following criteria:
  - human risk reduction potential;
  - ecological risk reduction potential; and
  - EPA regulatory interest.

- Derivation of the final cluster score:

  -- Score based on:
     - the individual member chemicals' overall scores
     - the score for one cluster-level criterion, i.e., the cluster's pollution prevention potential.

  -- pollution prevention potential criterion is scored based on three subcriteria:
     - the cluster human risk reduction potential;
     - cluster ecological risk reduction potential; and
     - chemical release reduction potential.

  -- the final cluster score is derived as the sum of the pollution prevention potential score and the mean of all overall chemical scores for that cluster.

System Evaluation

Scope of coverage:

- Addresses individual TSCA chemicals within the context of their use cluster. (That is, data for some of the criteria are dependent on the specific use cluster being examined, and may differ for a given chemical with several uses.)

Media addressed:

- System does not score the chemical on a media- or pathway-specific basis; only aggregate releases to the environment are considered.

- However, because it uses total release information based on the Toxics Release Inventory (TRI), this system implicitly addresses the following media:

  -- direct releases to air
  -- land (landfill, underground injection)
  -- surface water (direct releases, POTW transfers)

  Cross-media transfers are not explicitly considered.

Types of targeting criteria used:

- Criteria and criteria-score combinations used in this system generally conform with the risk assessment paradigm (i.e., hazard x exposure = risk).

- Of the chemical-level criteria listed in Exhibit 1, two relate to human risk potential (i.e., human *hazard* potential and human *exposure* potential), and another two to ecological risk potential (i.e., ecological *hazard* potential and ecological *exposure* potential):

- "EPA's regulatory interest" criterion assigned as follows:

  -- chemical is directly assigned a score of 3, 2, or 1 for this criterion based on the number of regulatory lists of interest on which it appears (e.g., CWA Priority Pollutants list; RCRA P and U lists).

  -- criterion meant to measure the Agency's previous and current interest in the chemical.

- "Cluster's release reduction potential (RRP)" criterion (the cluster's RRP score is the average of the RRP scores for all chemicals in that cluster):

  -- based on its member chemicals' "efficiency-of-use," i.e., ratios of their release to use volume, estimated from TRI data (this ratio measures the fraction of a chemical throughput that is released to the environment).

- Key targeting criteria are summarized in Exhibit 2.

Data requirements:

- Type of data required varies considerably across criteria/subcriteria, but data requirements are moderate.

- Use of specified data sources:

  -- reviewed documentation specifies a data hierarchy for most of the criteria/subcriteria; sources of input data are well described (e.g., TRI, Clinical Toxicology of Commercial Products, HEAST, IRIS)

- Specifies methods for handling missing data and the use of professional judgment.

Applicability to waste minimization targeting:

Pros

- System explicitly considers pollution prevention potential of chemicals.

- Although data-intensive, system is flexible in using data of varying quality, and allows use of professional judgment

Cons

- Focuses on the "riskiness" of a chemical specific to a use.

- System uses a number of exposure-related subcriteria that are not directly comparable. Some of the exposure-related subcriteria measure exposure magnitude (e.g., total

releases), others exposure extent (e.g., number of workers), and still others chemical properties related to exposure likelihood, magnitude, and duration. This part of the system may be internally inconsistent (since exposure is assigned a score using the single highest-scoring subcriterion) and may also "double-count" exposure, and as a result, exposure may be weighted too high relative to toxicity. That is, because there are similar exposure factors in both the human ecological criteria, exposure is essentially "double counted" relative to hazard.

Exhibit 2. Targeting Criteria Used in the Chemical Use Clusters Scoring Methodology

TARGETING CRITERIA	
Direct Risks	
Waste volume	
Waste/constituent toxicity: Human toxicity Ecological toxicity	 ✓ ✓
Constituent concentration or mass	✓
Waste type (e.g., solvents)	
Number of generators (use sites)	✓
Waste management practices	
Releases to environmental media	✓
Potential for constituent transport	✓
Potential for cross-media transfer	
Potential for human exposure: residential settings occupational settings	 ✓ ✓
Potential for ecological exposure	✓
Indirect or Acute Risks	
Ignitability, corrosivity, reactivity	
Ozone depletion potential	
Global warming	
Other Targeting Criteria	
Hazardous waste management capacity	
Technical/administrative feasibility	
Permitting/enforcement factors	
Other factors: EPA regulatory interest pollution prevention potential	 ✓ ✓

EPA's 33/50 Program[3]

Purposes of the Methodology/System

- To target 17 chemicals and reduce their national aggregate releases by 33% by the end of 1992 and 50% by the end of 1995.
- To encourage pollution prevention activities, including source reduction and in-process recycling, in achieving these reductions.
- A voluntary reduction program. Not legally enforceable; companies are free to commit to their own reduction goals and to develop their own cost-effective strategies.
- EPA will not measure individual company efforts in program, but instead will measure progress on a national, aggregate basis (i.e., looking at the reduction in total releases of all 17 chemicals).

System Description

- In the targeting process, the 33/50 Program:
  - -- canvassed all major EPA offices for a list of their highest priority chemicals based on each office's own ranking criteria and selected from the TRI (a public data base containing information on annual releases and transfers of about 300 toxic chemicals);
  - -- designated all chemicals in more than one list as potential candidates for the program (25 chemicals); and
  - -- narrowed down the 25 chemicals to 17 by informally applying three criteria:
    - production and environmental release volumes;
    - toxicity to humans; and
    - the potential for reducing releases through pollution prevention practices.

The 17 chemicals were selected from a pool of TRI chemicals; the TRI will be used to track the progress of reaching the 50% reduction goal.

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[3]Documentation reviewed:

U.S. EPA. 1992. *Questions and Answers: U.S. EPA's 33/50 Program* [no document number given].

Telephone conversations with EPA staff members of the 33/50 Program: David Sarokin (Project Manager), John Harman, Mike Burns, Loren Hall.

Contact: David Sarokin (202/260-6396)

- Process used in targeting chemicals was qualitative and did not rely on a standard targeting approach:
  - 17 chemicals are not necessarily the "riskiest"
  - 17 chemicals are not the only chemicals the program is concerned about
  - the program, if successful, will be expanded to cover additional chemicals
- The 'narrowing down' process had the following characteristics:
  - no numerical ranking; ranked toxicity and volume in a high-medium-low system
  - professional judgment used
  - no standardized measure used for volume, though total releases and transfers in TRI were commonly used by EPA offices
  - no standardized measure used for toxicity, though RQs and carcinogenic potential were commonly used by EPA offices
  - pollution prevention potential criterion was especially subject to professional judgment, based on "the collective experience of the people" involved with the program
  - most weight was given to pollution prevention potential because most of candidates were high-volume and high-toxicity chemicals

System Evaluation

Scope of coverage:

- All constituents found in the TRI.

Media addressed:

- The 17 target chemicals were selected partially because they are produced in large quantities and released in large quantities into the various media addressed in the TRI, including:
  - air releases
  - surface water releases
  - discharge to POTWs
  - on-site land releases
  - off-site transfers

Types of targeting criteria used:

- Quantity of production and environmental release (total TRI releases and transfers)

- Toxicity/hazard (RQs and carcinogenic potential)
- Potential for reduction through pollution prevention practices
- Individual offices used own targeting criteria that are not specified in the documentation reviewed
- Targeting criteria used in the 33/50 Program are summarized in Exhibit 1.

Applicability to waste minimization targeting:

Pros

- Targeting process incorporated perspective from major EPA offices
- The 33/50 Program's concept of using a 'pilot' phase, i.e., targeting a few high-risk (but not necessarily the highest risk) candidates and then expanding the program if successful, may be applicable to developing the waste minimization targeting program.

Cons

- The program's targeting process was heavily dependent upon professional judgment and was not scientifically rigorous.

Exhibit 1. Targeting Criteria Used in the 33/50 Program.

TARGETING CRITERIA	
Direct Risks	
Waste volume	
Waste/constituent toxicity Human toxicity Ecological toxicity	✓
Constituent concentration or mass	✓[1]
Waste type (e.g., solvents)	
Number of generators	
Waste management practices	
Releases to environmental media	✓
Potential for constituent transport	
Potential for cross-media transfer	
Potential for human exposure: residential settings occupational settings	
Potential for ecological exposure	
Indirect or Acute Risks	
Ignitability, corrosivity, reactivity	
Ozone depletion potential	
Global warming	
Other Targeting Criteria	
Hazardous waste management capacity	
Technical/administrative feasibility	
Permitting/enforcement factors	
Cost savings	
Other factors Pollution prevention potential Canvass of EPA offices	✓ ✓[2]

[1] Mass released to various media.
[2] System used chemicals determined as being of priority by other EPA offices.

EPA Regional Comparative Risk Ranking Program[4]

Purpose of the methodology/system

- Analytical framework to systematically measure, compare, and rank environmental problems to:
  - -- help risk managers identify the worst environmental problems and risks;
  - -- provide common ground for evaluating the net benefits and costs of different strategies for reducing or preventing risks; and
  - -- share acquired information with the community and general public.

System description

- Although the system provides fairly specific guidance and methods, it allows flexibility in implementing the approach.
- System has three main components: (1) project planning and start-up; (2) comparative risk ranking; and (3) risk management.
- Comparative risk ranking is divided into four parts: separate rankings of risks to human health, ecosystems, and quality of life; and an integrated ranking of these three risk areas. The integrated ranking groups the problems in several tiers of descending risk.
- The system components are summarized in Exhibit 1. The component for assessing risks to human health, ecosystems, and quality of life is described below.

(1) Assessing risks to human health

- Identify hazards to human health, including:
  - -- target pollutants (limit to pollutants that best represent actual risks)
  - -- relevant exposure pathways
  - -- adverse health effects (cancer and/or non-cancer)

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[4] Documentation reviewed:

U.S. EPA. September 1993. *A Guidebook to Comparing Risks and Setting Environmental Priorities.* Prepared by the Office of Policy, Planning, and Evaluation, U.S. Environmental Protection Agency, Washington, D.C. EPA 230-B-93-003.

Vermont Agency of Natural Resources. *Environment 1991: Risks to Vermont and Vermonters.* Report by the Public Advisory Committee, The Strategy for Vermont's Third Century.

Contact: Debora Martin (202/260-2699)

Exhibit 1: Components of the Comparative Risk Ranking Program

(1) Project Planning and Start-up

- Assemble planning team:
  - Project Manager
  - Steering Committee
  - Public Advisory Committee
  - Technical Work Groups
- Define scope of and goals for the project
- Secure support of key stakeholders
- Determine public participation role
- Determine ranking process and who is responsible for each ranking
- Determine process to convert ranking results into risk reduction strategies and budget decisions

(2) Comparative Risk Analysis

- Finalize list of potential risks for ranking
- Gather data
- Assess residual risks and future risks for hazards to human health, ecosystems, and quality of life
- Address transboundary effects of risks
- Prioritize risks by ranking them qualitatively or quantitatively depending on data availability/needs
- Document risk analysis method
- Identify areas of uncertainty requiring more research/data
- Identify environmental indicators that will help monitor risks in the future

(3) Risk Management

- Assess and rank risks for management by:
  - identifying the most serious/adverse environmental and/or health risks;
  - identifying community values concerning risks; and
  - ranking risks in order of seriousness and community values.
- Select risk management factors
- Determine risk reduction goals
- Revise priorities and reduce risks by:
  - deciding which risks to address;
  - developing action plans to reduce risks; and
  - developing ongoing monitoring programs to ensure that risks are reduced effectively.
- Propose action plan — activities to reduce or prevent risk, a schedule, and measures of progress
- Develop actions to overcome barriers
- Document action plans
- Establish process for repeating risk ranking or updating results

- Assess dose-response relationship:
  - cancer potency factors for carcinogens
  - reference dose and other maximum safe levels for non-carcinogens
- Assess magnitude, duration, and frequency of exposure:
  - identify significant exposure pathways and routes
  - identify sources, location, timing, and quantity of pollutants released
  - describe fate and transport of pollutants
  - estimate concentration of pollutants
  - define human exposures (identify exposed populations, calculate intakes)
  - describe and document uncertainties in the data
- Characterize potential risks (cancer and non-cancer):
  - individuals
  - populations
- Rank potential risks (cancer and non-cancer):
  - quantitative factors (e.g., cancer incidence, non-cancer hazard indices)
  - qualitative factors (severity of effects, quality of data)
  - risk ranking exists along spectrum ranging from purely judgmental to rigorously quantitative
- Combine cancer and non-cancer risks:
  - very general guidance for this step
  - non-quantitative or semi-quantitative, depending on judgment and data availability
  - group potential cancer and non-cancer health effects together in matrix with population data to determine three separate categories of relative risk, e.g., "catastrophic," "serious," or "adverse"
  - if desired, an overall health rating can be obtained by aggregating all the health-effect category rankings, assuming equal weight for all rankings

(2) Comparing and assessing ecological risks

- Determine and define environmental problem:
  - isolate/partition problem by geographical area or ecosystem type
  - select criteria to evaluate the problem (e.g., area of impact, severity or reversibility of impact, uncertainty, or "value" of ecosystem)

- Analyze the problem:

  - identify stressors (e.g., chemicals) and establish causal link between problem and ecological effects
  - estimate exposures (e.g., estimate concentrations)
  - characterize ecological effects

- Characterize risks (using narrative and/or numeric descriptors):

  - describe each problem area using common evaluative criteria (e.g., severity of impact is "low")
  - summarize overall risk across stressors or problem areas to specific geographical area or ecosystem type
  - aggregate risks across all geographical areas or ecosystem types in the study

- Compare and rank risks:

  - compare ecological risks posed by different problem areas and rank them into broad categories of relative risk (professional judgement and consensus-building are integral to this process)

(3) Quality-of-life assessments

- Identify impacts of pollution on society and determine community values and social concerns:

  - spiritual, cultural, aesthetic, religious, ethnic values, or concern for future generations
  - environmental justice for diverse populations and lifestyles
  - economic stability for natural-resource-intensive industries

  Ensures that assessment process has broad public support and accurately represents public concerns

- Define evaluative criteria based on broadly shared public values for evaluating effects of pollution on quality of life (e.g., no. of people affected, reduced recreational opportunities).

- Collect and analyze data:

  - surveys, questionnaires, census data, public meetings
  - analytic methods (e.g., damage to materials, commercial harvest losses, health care costs, recreational losses, property-value losses, resource restoration costs, aesthetic damage)

- Characterize impacts for all problem areas:
  - long-term damage (e.g., ozone depletion in the future will increase health care costs and damage PVC plastics)
  - loss of natural resources (e.g., oil, minerals, wood)
  - loss of natural ecosystem services (e.g., protection from UV radiation by the ozone layer, purification of water by wetlands)
- Present findings and rank impacts to quality of life using qualitative and/or quantitative data:
  - establish integrated ranking of impacts
  - document process, which may require controversial analytic methods
  - combine qualitative descriptions of impacts with dollar damage estimates
- Analyze future environmental conditions (i.e., incorporate longer-term viewpoint into the assessment of environmental problems).

System evaluation

Scope of coverage:

- Selects problems from a core list of environmental problems (e.g., industrial wastewater discharges to oceans, lakes, and rivers; physical degradation of terrestrial ecosystems/habitats).
- Examines risks from current pollution — whether short-lived or present for centuries — and effects of today's pollution on the future. Does not try to evaluate risks from tomorrow's pollution due to the speculative nature of predicting trends.

Media addressed:

- Media are considered to be integrated, not discrete. System evaluates interrelated causes and effects of pollution to air, water, and land.

Types of targeting criteria used:

- Uses a broad range of targeting criteria; key criteria are summarized in Exhibit 2.
- Human health and ecological risk; adverse effects on quality of life.
- Inadequacies of environmental regulations: risks created by uncoordinated government actions and risks created by programs that fail to address complex relationships among environmental problems.
- Economic viability, technological feasibility, and social equity.

Data requirements:

- Qualitative and quantitative data on risks to human health and ecosystems developed or gathered by the Technical Work Groups using the system, depending on availability and quality of data.

- Public ethics, values, and concerns (e.g., health of children, protection of ecosystems, well-being of future generations) as expressed by public forums and surveys.

- Use of professional judgment varies considerably during the individual risk rankings, depending on the quality and availability of necessary data.

Applicability to waste minimization targeting:

Pro

- Broad framework allows flexibility in implementing the approach.

- Integrates judgment and technical expertise with values and concerns expressed by the community to determine which risks are of priority. Eliminates public confusion caused by information that is obsolete, incomplete, or biased to serve a particular viewpoint.

Con

- System is labor intensive and politically charged. Substantial investment of money and time necessitates careful planning for the process as a whole, not in segments.

- Problems are considered by the system to have interrelated causes and interrelated effects. May be difficult to adapt the system to discrete problems like RCRA wastestreams at specific facilities.

- Because of the significant latitude in structuring and scoring the criteria, and in relying on expert judgement, may get different results in different applications.

Exhibit 2: Targeting Criteria Used in the Regional Comparative Risk Ranking System

TARGETING CRITERIA	
Direct Risks	
Waste volume	
Waste/constituent toxicity Human toxicity Ecological toxicity	 ✓ ✓
Constituent concentration	✓
Waste type	
Number of generators	
Waste management practices	✓
Releases to environmental media	✓
Potential for constituent transport	✓
Potential for cross-media transfer	✓
Potential for human exposure: environmental settings occupational settings	✓
Potential for ecological exposure	
Indirect or Acute Risks	
Ignitability, corrosivity, reactivity	
Ozone depletion potential	✓
Global warming	✓
Other Targeting Criteria	
Hazardous waste management capacity	
Technical/administrative feasibility	✓
Permitting/enforcement factors	
Cost savings	✓
Other factors Quality of life	 ✓

OPPTS Existing Chemicals Screening Program[5]

Purpose of the Methodology/System

- "To screen, establish testing requirements for, assess, and develop strategies for managing risks posed by chemicals currently in production or use."
- To make decisions on regulatory and nonregulatory actions to reduce or eliminate the possibility of harm to human health or the environment.
- Program recently amended to increase effectiveness of its risk management actions, to increase public involvement and public understanding of the risks of chemicals, to incorporate the concept of pollution prevention, and to integrate the program with agency-wide risk reduction priorities.

System Description

- Program composed of three stages: Risk Identification, Risk Evaluation, and Risk Management.

Risk Identification

- Program receives and reviews substantial amount of risk-related information on chemicals submitted by chemical manufacturers and other sources in response to TSCA Section 8; this information includes:
  - -- production, use, and exposure data from manufacturers required under Section 8(a);
  - -- section 8(c) records of "significant adverse reactions;"

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[5]Documentation reviewed:

"EPA's Existing Chemical Program: An Overview" [no date or source]

U.S. EPA. 1991. *RIB How-to Guide: RM1 Economic Reports*. Regulatory Impacts Branch, Economics and Technology Division, Office of Toxic Substances, U.S. Environmental Protection Agency, Washington, D.C.

U.S. General Accounting Office. 1984. *Report by the Comptroller General of the United States: EPA's Efforts to Identify and Control Harmful Chemicals in Use*. Gaithersburg, MD. GAO/RCED-84-100.

U.S. EPA. 1986. *Toxic Substances Control Act (TSCA): Report to Congress for Fiscal Year 1985*. U.S. Environmental Protection Agency, Washington, D.C.

Contact: John Leitzke (202/260-3507)

- section 8(d) health and safety studies; and
- section 8(e) substantial risk notifications.

- Other information reviewed by the program includes:

  - Chemical Hazard Information Profiles;
  - Substitute Hazard Profiles;
  - National Toxicology Program Studies; and
  - monitoring studies, which are reviewed to obtain data on levels of human and environmental exposure to substances of concern (for example, the National Adipose Tissue Survey is reviewed to detect TSCA-related chemicals in human tissue; occupational exposure monitoring studies are reviewed to assess human exposure)

Risk Evaluation

- EPA determines nature and magnitude of risks by analyzing health and environmental effects data gathered during risk identification activities

- EPA performs chemical-specific risk assessment based on both toxicity and exposure (e.g., for formaldehyde, EPA evaluated the two largest populations exposed to this chemical, i.e., permanent press apparrel manufactures and mobile home owners) and decides on need for risk management activities

Risk Management

- Two phases: Risk Management One (RM1) and Risk Management Two (RM2)

RM1

- Based on qualitative risk evaluations (i.e., initial screening that relies on readily available data on potential toxicity and potential exposure) developed for each chemical candidate, the RM1 committee selects one of four options:

  - placing chemical on the Master Testing List (i.e., a priority testing list) because of significant data gaps relating to the chemical's hazard or exposure potential;

  - placing chemical on the Risk Reduction List if it is believed or known to pose significant risks;

  - placing chemical on the Regional Activities Track if concern for chemical is limited to specific geographic regions; or

  - dropping chemical from the list of candidates for risk management.

- From chemicals placed on Risk Reduction List, OPPTS selects a subset as potential candidates for action under RM2 phase, using four criteria:

-- TSCA jurisdiction;
-- potential or known toxicity;
-- potential or known exposure to the chemical; and
-- potential for pollution prevention.

(Only chemicals from the Risk Reduction List enter the RM2 stage.)

- The documentation reviewed did not describe what happens to chemicals that are *not* placed on the Risk Reduction List.

- *Important point*: From the documentation reviewed, it appears that there is no standard system or "cook-book" type approach by which each chemical is evaluated in the risk management process. Rather, the priority of action for each chemical in the Existing Chemicals Program (i.e., a chemical's relative "riskiness") is determined on a case-by-case basis through a review of risk assessments and all relevant information gathered, as discussed above, and through coordination among various divisions in OPPTS. This review for each chemical in the RM1 phase takes the form of a 12-week review cycle, approximating the steps outlined in Exhibit 1.

Exhibit 1. The RM1 Project Cycle

1. The **Existing Chemical Assessment Division** (ECAD) coordinates the initial screening process to select chemical candidates for the RM1 phase. ECAD prepares a dossier on the chemical, and, along with three other OPPTS divisions involved in the project cycle, has a schedule in which to complete its assigned report that will make up the dossier.

2. The **Economics and Technology Division/Industrial Chemistry Branch** prepares a chemistry report for the chemical under review during Week 1.

3. The **Economics and Technology Division/Regulatory Impacts Branch** prepares the RM1 economics report during Week 3. The report is based on data elements that include volume information, market trends, use data, producer data, importer data, and substitutes data.

4. The **Economics and Technology Division/Chemical Engineering Branch** prepares the engineering report which evaluates worker exposures and releases into the environment for the chemical during Week 5.

5. The **Health and Environmental Review Division** (HERD), during Week 5, prepares the hazard report which reviews the health and environmental hazards posed by the chemical under review.

6. The **Exposure Evaluation Division/Exposure Assessment Branch**, during Week 7, prepares the exposure report which evaluates the environmental concentrations of the chemical as well as consumer and general public exposures.

7. The **Existing Chemical Assessment Division** prepares a dossier based on the reports listed above during Week 9.

RM2

- Existing information is investigated thoroughly so that OPPTS may better its understanding of the chemical's hazard and risks and, more specifically, determine which portions of a chemical's lifecycle (manufacture, processing, distribution, use, or disposal) pose risks.

- Results of the investigation are used to select a risk management strategy that may consist of multiple components including:

  -- public awareness campaign;

- call to industry for voluntary action;
- enforcement of existing regulations;
- development of new regulations (e.g., bans, labeling requirements); and
- removal of the chemical from further consideration.

- Potential risk reduction actions are developed, emphasizing source reduction, responsible recycling, improved treatment technologies, and improved disposal technologies.

System Evaluation

Scope of coverage:

- Chemical-specific; does not consider wastes or wastestreams specifically.

- Population of potential chemical candidates evaluated in the initial screening of the RM1 phase consists of the approximately 14,000 chemicals found on the TSCA Inventory whose annual production quantities exceed 10,000 pounds.

- Considers risk from chemical's entire lifecycle (manufacture through disposal)

Media addressed:

- Because program is a case-by-case evaluation of risks posed throughout a chemical's lifecycle, it appears that multiple media and exposure pathways would be considered (although they may differ from chemical to chemical).

Types of targeting criteria used:

- *Statutory*: Language in TSCA gives EPA discretion to determine "unreasonable risk" posed by a chemical to human health or the environment; such a determination is the trigger mechanism for control action under TSCA. In assessing unreasonable risk, EPA must consider the following criteria in initial RM1 screening activities:

  - human health and environmental hazard;
  - degree of human and environmental exposure;
  - the benefits provided by the chemical's uses;
  - the availability of substitutes for such uses; and
  - the economic consequences of regulating the chemical, considering impacts on national economy, small business, technological innovation, the environment, and public health.

- *RM2*: The four criteria used by OPPTS in moving chemicals from the Risk Reduction List to the RM2 phase as candidates for risk management activities are:

  - TSCA jurisdiction
  - potential or known toxicity of the chemical

- potential or known exposure to the chemical
- potential for pollution prevention

- Targeting criteria used in the Existing Chemicals Program are summarized in Exhibit 2.

Data Requirements:

- Initial screening of chemicals prior to the RM1 stage utilizes TSCA section 4 test rule data:

  - EPA has authority under Section 4 of TSCA to require by rule that chemical manufacturers and processors test for various health and environmental effects.

  - test rules imposed on industry by EPA:
    - are chemical-specific;
    - require testing for specific human health and environmental effects;
    - specify test standards;
    - impose submission deadlines for test data; and
    - assign responsibility for testing.

- Based on reviewed documentation, it appears that the reporting process in the RM1 project cycle is data-intensive and requires the various OPPTS divisions to supplement existing information in order to fulfill certain data requirements.

  - example: Regulatory Impacts Branch (RIB), in preparing the economics report, has to base its research on readily available secondary sources and must conduct a library search for data on the volume, market trends, uses, producers and importers, and substitutes for the RM1 chemical; examples of sources include:
    - SRI, *Chemical Economics Handbook*
    - SRI, *Directory of Chemical Producers*
    - EPA Regulatory Analyses
    - on-line search of chemical industry business and chemistry data bases available through DIALOG and STN International

Applicability to Waste Minimization Targeting:

Pros

- Several stages of the program incorporate the concept of pollution prevention (although from the documentation available, it's not clear what 'subcriteria' are used to determine a chemical's potential for pollution prevention).

- The chemical targeting system is intertwined with a system of risk management strategy development.

Cons

- The program is designed to address individual chemicals and not wastes, wastestreams, or industrial establishments.
- The program has no standard system of risk evaluation; rather, chemicals are evaluated on a case-by-case basis by various branches/divisions within OPPTS.
- The preparation of the chemical dossiers involves coordination among many branches and divisions of OPPTS and is time- and resource-intensive. This approach accounts for many relevant factors and develops consensus on the 'riskiest' chemicals.

Exhibit 2. Targeting Criteria Used in the OPPTS Existing Chemicals Screening Program

TARGETING CRITERIA	
Direct Risks	
Waste volume	
Waste/constituent toxicity Human toxicity Ecological toxicity	 ✓ ✓
Constituent concentration or mass	✓
Waste type (e.g., solvents)	
Number of generators	✓
Waste management practices	
Releases to environmental media	✓
Potential for constituent transport	
Potential for cross-media transfer	
Potential for human exposure: residential settings occupational settings	 ✓ ✓
Potential for ecological exposure	✓
Indirect or Acute Risks	
Ignitability, corrosivity, reactivity	
Ozone depletion potential	
Global warming	
Other Targeting Criteria	
Hazardous waste management capacity	
Technical/administrative feasibility	
Permitting/enforcement factors	
Cost savings	
Other factors Potential for pollution prevention Availability of substitutes Economic impacts of regulating chemical Benefits of chemical uses	 ✓ ✓ ✓ ✓

Industrial Pollution Prevention Opportunities for the 1990s[6]

Purpose of the Methodology/System

- System was a one-time research effort to identify a short list of industries, or industry segments, that present significant opportunities for waste reduction and pose environmental problems or risks in terms of the wastes generated.

- More generally, the system was expected to "provide a data base that could be used as guidance by the EPA for the development of a research strategy for pollution prevention."

System Description

- System is based on subjective, expert evaluation of 12 criteria (see Exhibit 1). Of the 12, 11 are non-risk-based criteria (listed under "Other factors" in Exhibit 1).

- First, a list of 175 industries was selected from the 1987 SIC publication based on the selection criteria.

- Second, the 175 SIC-based industries/industrial sectors were shortlisted to a group of 20 by experts from USEPA, academia, state pollution prevention programs, and contractor personnel, again using the 12 selection criteria. The 20 SICs were ranked in priority order by the experts.

- Finally, the experts "subjectively normalized" the SIC-based industries (aggregating the multi-segmented SICs) and developed a list of 17 industry segments (see Exhibit 2) for further research into pollution prevention opportunities. This list is supposed to best represent the problems and opportunities for pollution prevention.

System Evaluation

Scope of coverage:

- Covers industries/industrial sectors covered by four-digit SIC codes; system does not use information at the wastestream or constituent level.

Media addressed:

- System does not explicitly consider releases or threat of releases to any media; experts may or may not have considered such releases when selecting the priority industries.

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[6] Documentation reviewed:

U.S. EPA. Aug. 1991. *Industrial Pollution Prevention Opportunities for the 1990s.* Prepared by the Office of Research and Development, U.S. Environmental Protection Agency, Washington, D.C., EPA/600/8-91/052.

Contact: Ivars Licis (513/569-7718)

Exhibit 1: Targeting Criteria Used in the Industrial Pollution Prevention Opportunities for the 1990s System (cont.)

TARGETING CRITERIA	
Direct Risks	
Waste volume (pounds)	✓
Waste/constituent toxicity	✓
Constituent concentration	
Waste type	✓
Number of generators	
Waste management practices	✓
Releases to environmental media	
Potential for constituent transport	
Potential for cross-media transfer	
Potential for human exposure: environmental settings occupational settings	
Potential for ecological exposure	
Indirect or Acute Risks	
Ignitability, corrosivity, reactivity	
Ozone depletion potential	
Global warming	
Other Targeting Criteria	
Hazardous waste management capacity	
Technical/administrative feasibility	
Permitting/enforcement factors	
Cost savings	

Exhibit 1: Targeting Criteria Used in the Industrial Pollution Prevention Opportunities for the 1990s System (cont.)

Other factors	
Importance of industry to society or nation	✓
Large frequency of small to mid-size firms that would benefit from govt. participation	✓
Significant benefits would be derived from WM	✓
WM would not adversely impact product quality or marketability	✓
WM would offer cost benefits in the long run	✓
WM in this industry would be readily transferable to others	✓
Industry has exhibited interest in WM	✓
WM appears to be technologically achievable	✓
Industry would benefit from govt. involvement	✓
Industry would be receptive to WM studies	✓
Industry will not be viable in the long run without massive changes	✓

Types of targeting criteria used:

- Targeting criteria used in this system are varied; some relate, at least indirectly, to risk, and others to measures such as the industry's potential for success in pollution prevention.

- Targeting criteria were chosen for evaluating or comparing the relative importance, as perceived by an expert, of certain industry characteristics/attributes that would relate to the industry's feasibility for pollution prevention research. Examples of these attributes include industry size, waste production in terms of toxicity and/or volume, and receptivity of the industry to innovation.

- System relied on professional judgement for factors such as the degree to which each criterion had to be satisfied and the number of criteria that had to be satisfied simultaneously by the industry being reviewed.

Data requirements:

- Documentation does not explain what data were used by the experts in selecting the 17 priority industry segments; only "best informed judgement" is mentioned.

Applicability to Waste Minimization Targeting:

Pros

- 17 industry segments that have expert consensus on their feasibility for pollution prevention can be used as starting point for identifying specific wastestreams for WM.

Cons

- Based on available documentation, methodology used to prioritize industries is not well defined and does not appear to reproducible.
- System cannot be used again without reconvening an expert panel.
- Neither specific targeting criteria nor data needs are well defined.

Exhibit 2: Priority Industry Segments Identified for Pollution Prevention Research[1]

Textile dyes and dyeing
Wood preserving
Pulp and paper
Printing
Chemical manufacture
Plastics
Pharmaceutical
Paint industry
Ink manufacture
Petroleum industry
Steel industry
Non-ferrous metals
Metal finishing
Electronics/semiconductors
Automobile manufacture/assembly
Laundries/dry cleaning
Automobile refinishing/repair

[1] Because they are "normalized" from a larger set of industry segments, these 17 do not directly correspond to any SIC.

National Corrective Action Prioritization System (NCAPS)[7]

Purpose of the Methodology/System

- Used to prioritize treatment, storage, and disposal facilities (TSDFs) regulated under RCRA for possible corrective actions.

- Meant to be an internal EPA management tool and is not subject to external review, comment, or approval

- Incorporates many of the same factors and equations as the Hazard Ranking System (HRS), but is much simpler and less data-intensive. The equations for pathway scores are conceptually similar to those in the HRS in that they involve multiplication of release, waste characterization, and targets related factors, and division by a scaling factor. However, the factors are scored in a much simpler fashion.

System Description

- NCAPS facility migration score determined by evaluating four routes of potential contamination:

  -- ground water
  -- surface water
  -- air
  -- on-site exposure

- Each route of potential contamination scored based on the scores assigned to specific factors (illustrated in Exhibit 1) that fall into one of the five following categories:

  -- releases
  -- route characteristics
  -- containment
  -- waste characteristics
  -- targets

- Factor scores are combined using route-specific and scenario-specific formulae (e.g., formulae dependent on the presence of an observed release or a possible release) and the resulting values are normalized to generate route scores between 0 and 100.

---

[7]Documentation reviewed:

U.S. EPA. 1991. *Environmental Protection Agency Technical Enforcement Support at Hazardous Waste Sites: National RCRA Corrective Action Prioritization System Guidelines Revised.* Prepared by ICAIR Life Systems, Inc. Revised by PRC Environmental Management, Inc.

RCRA Prioritization System Scoring Summary [no other citation information].

Contact: Dave Fagan (703/308-8620)

- it appears that the scoring process for each route is strongly dependent on the presence of an observed release.

- Facility migration score is calculated by combining the four route scores in a root-mean-square equation.

- Chemical- or waste code-specific data requirements used in the scoring process include:

  - toxicity, based on the Sax rating (i.e., a toxicity rating scheme, that emphasizes acute toxicity, used in the original HRS)
  - persistence
  - waste quantity (based on known or estimated amounts)

- Concentrations of contaminants are not considered. However, waste quantity is considered (e.g., for scoring observed releases, the amount of waste actually released is considered).

- Factors in the releases, route characteristics, containment, and targets categories are generally exposure-related.

System Evaluation

Scope of coverage:

- NCAPS scores and ranks TSDFs covered under RCRA.

- RCRA constituents and wastes.

Media addressed:

- Ground water

- Surface water

- Air

- Direct on-site exposure (i.e., direct physical contact):

  - nearby residential population with potential access to a site
  - sensitive environmental populations

Types of targeting criteria used:

- In general, NCAPS scoring factors are risk-based, relating to exposure (e.g., observed and possible releases, route characteristics factors, targets factors, persistence, and containment) and toxicity. Key targeting criteria are summarized in Exhibit 2.

- Some NCAPS targeting factors are based on permit information. For example:

- scoring for releases in the surface water route is partially dependent on whether the discharge (outfall) was permitted and whether permit violations have occurred at the facility.

- in such cases, scoring the observed release factor applies only to facilities with unpermitted discharges while scoring the possible release factor applies to facilities with permits.

- Facility history may also affect NCAPS scoring. For example:

  - for facilities that have removed their hazardous wastes but have past containment practices ranked less than 'very good', scoring for releases uses the past containment rating

  - the air route is scored for the possible release factor if residents have complained of odors or if a facility investigator has noted odors

Data requirements:

- Not especially data-intensive (relative to HRS)

- In the absence of site-specific information for scoring some factors, the NCAPS guidance supplies default assumptions that can satisfy the data requirements of the scoring equations.

- Types of data sources that can be used in the NCAPS scoring process:

  - documentation of releases of hazardous waste or hazardous constituents:
    - RCRA Facility Assessment (RFA)
    - Preliminary Review/Visual Site Inspection (PR/VSI)
    - CERCLA Preliminary Assessment (PA) report
    - Preliminary Assessment/Visual Site Inspection (PA/VSI) report

  - waste quantity information:
    - RCRA Part A permit application
    - tank capacity
    - permitted drum storage capacity
    - other site report information

  - targets:
    - quantification of population size is not required
    - wetlands, streams, rivers, and residential areas as well as their distances from the facility can be identified in a United States Geological Survey map

Applicability to waste minimization targeting:

Pros

- Considers RCRA wastes and RCRA constituents.

- Factors used for scoring conform to risk assessment requirements.

Cons

- Unlike other systems such as the HRS, NCAPS does not carry the weight of external review, comment, or approval
- May not be sufficiently quantitative; for example:
  - -- population size potentially affected by releases is not quantified
  - -- waste characteristics include only waste quantity, toxicity, and persistence; several other characteristics are not considered, such as bioaccumulation potential and contaminant concentrations
  - -- incorporates multiple assumptions that may be used in the absence of specific information (for example, when evaluating facilities in communities adjacent to any Great Lake, the communities are assumed to obtain their residential water supply from the lake unless there are available data to disprove this assumption)
- In scoring an entire facility, NCAPS does consider releases from individual active units, which could include combustion units.

Exhibit 1. Factor Categories and Factors Used in NCAPs Scoring

Factor Category	Factors
Releases to the Environment	Ground water route observed releases Surface water route observed releases presence of permitted outfalls presence of permit violations Air route presence of observed, unpermitted, ongoing releases existence of facility operating air permit permit violations or odor complaints by residents can contaminants migrate into air? containment
Route Characteristics (evaluated when an observed release has not been scored for a particular route)	Ground water route depth to aquifer net precipitation physical state Surface water route facility location 24-hour rainfall distance to surface water physical state On-site exposure route site accessibility
Containment	Ground water route evaluates containment properties of: surface impoundments containers/tanks piles landfills Surface water and on-site exposure routes evaluate containment properties of: surface impoundments containers/tanks piles landfills Air route evaluates containment properties of: closed and open containers and tanks
Waste Characteristics	Toxicity Persistence Waste quantity

Exhibit 1 (continued). Factor Categories and Factors Used in NCAPs Scoring

Factor Category	Factors
Targets	Ground water route ground water use distance to intake Surface water route surface water use distance to intake or contact point distance to sensitive environment Air route population (residences, industries, agricultural lands, other) distance to sensitive environments On-site exposure route distance to residential areas on-site sensitive environments

Exhibit 2. Targeting Criteria Used in the National Corrective Action Prioritization System

TARGETING CRITERIA	
Direct Risks	
Waste volume	✓
Waste/constituent toxicity Human toxicity Ecological toxicity	✓
Constituent concentration or mass	✓ (mass only)
Waste type (e.g., solvents)	✓
Number of generators	
Waste management practices	
Releases to environmental media	✓
Potential for constituent transport	
Potential for cross-media transfer	✓
Potential for human exposure: residential settings occupational settings	 ✓ ✓
Potential for ecological exposure	✓
Indirect or Acute Risks	
Ignitability, corrosivity, reactivity	
Ozone depletion potential	
Global warming	
Other Targeting Criteria	
Hazardous waste management capacity	✓
Technical/administrative feasibility	
Permitting/enforcement factors	✓
Cost savings	
Other factors Odor complaints by residents Exposure to agricultural lands	 ✓ ✓

Minnesota Office of Waste Management Nonhazardous Industrial Waste Targeting and Pollution Prevention Project[8]

Purpose of the Methodology/System

- Identify high-risk nonhazardous industrial wastes to target them for pollution prevention demonstration projects.
- Results from demonstration projects will be used to develop fact sheets and case study summaries to assist industry in achieving additional pollution prevention.

System Description

- Two hazard ranking (HR) values are developed for nonhazardous wastes managed in landfills: a Toxicity Characteristic Leaching Procedure (TCLP) value and a Recommended Allowable Limit (RAL) value. (RALs are established by the Minnesota Department of Health as standards for safe levels of chemicals in drinking water from private wells.)

  1. TCLP HR = annual waste volume * Σ (measured TCLP level/TCLP regulatory level for constituent *i*)

  2. RAL HR = annual waste volume * Σ (measured TCLP level/RAL for constituent *i*)

- Targeting is based on the TCLP HR and the judged potential for successful pollution prevention demonstration projects. (Documentation for this system does not explain how the RAL HR is used.)

System Evaluation

Scope of coverage:

- Industrial nonhazardous wastes managed in landfills, excluding one-time wastes (e.g., from spill cleanups).
- TCLP constituents.

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[8] Documentation reviewed:

Nonhazardous Industrial Waste Targeting and Pollution Prevention Demonstration Project, Interim Report, undated, prepared by the Minnesota Office of Waste Management under USEPA Solid Waste Management Assistance Grant Project X819717-01-0.

Media/pathways addressed:

- Ground water migration pathway.

Types of targeting criteria used (see Exhibit 1):

- Risk based: Waste volume plus all of the fate, transport, exposure, and toxicity factors considered in the development of TC regulatory levels.
- Non-risk based: Potential for successful pollution prevention; extent to which pollution prevention demonstration projects have already been conducted.

Data requirements:

- Waste volume: volume managed in landfills.
- Waste/constituent toxicity: TC regulatory levels; Minnesota RALs in drinking water wells.
- Constituent concentration (in leachate): TCLP results.
- Data are derived from (1) municipal/industrial waste co-disposal applications filed by waste generators; (2) annual reports filed by co-disposal facilities; and (3) data collected by a commercial nonhazardous waste landfill.

Applicability to waste minimization targeting:

Pros

- Calculations are simple and straightforward.
- Only two data elements are needed.

Cons

- Applicable only to landfilled waste (methodology can probably be adapted to other land management practices, but not to incineration).
- TCLP data may not be available for certain wastes/constituents, or, if available, may not be easily accessible if methodology is to be implemented by Headquarters.
- Method is designed for nonhazardous wastes but can be used for hazardous wastes if data are available.
- Does not account for additional risk via other exposure pathways, risk due to constituents other than TCLP constituents, or risk to ecological receptors.

Exhibit 1. Targeting Criteria Used in the Minnesota Office of Waste Management Nonhazardous Industrial Waste Targeting and Pollution Prevention Project.

TARGETING CRITERIA	
Direct Risks	
Waste volume	✓
Waste/constituent toxicity Human toxicity Ecological toxicity	✓
Constituent concentration or mass	✓
Waste type (e.g., solvents)	
Number of generators	
Waste management practices	
Releases to environmental media	✓[a]
Potential for constituent transport	✓[a]
Potential for cross-media transfer	
Potential for human exposure: residential settings occupational settings	✓[a]
Potential for ecological exposure	
Indirect or Acute Risks	
Ignitability, corrosivity, reactivity	
Ozone depletion potential	
Global warming	
Other Targeting Criteria	
Hazardous waste management capacity	
Technical/administrative feasibility	✓
Permitting/enforcement factors	
Cost savings	
Other factors	

[a] These are considered indirectly in deriving the measured and regulatory TC levels.

Numerical Hazard Ranking Scheme for Waste Scheduling[9]

Purpose of the Methodology/System

- Numerical scheme developed for ranking, according to hazard, the hazardous wastes listed in 40 CFR Part 261.
- At the time of development, intended to be used by EPA for scheduling the review of listed wastes with regard to land disposal restrictions.

System Description

- Relatively ranks wastestreams based on a "Hazard Index" (HI) score; the HI score (1 to 100) is calculated as the product of the wastestream's toxicity and exposure scores.
- Wastestreams with multiple constituents are ranked based on the toxicity and exposure scores of the single highest scoring constituent.
- Toxicity Score:
  - Scored from 1 to 9 based on chronic toxicity (using acceptable daily intakes or ADIs) or on carcinogenicity (using unit carcinogenic risk or UCR). The chronic toxicity score is adjusted upward by 1 if the constituent scores "high" for acute toxicity (based on LD_{50}, LC_{50}, or LD_{lo}).
  - All constituents are scored for toxicity; system provides a data hierarchy to score all constituents, irrespective of how well they are characterized in terms of toxicity.
- Exposure Score:
  - Scored from 1 to 10 based on a total exposure dose, where

$$\text{Dose}_{\text{total}} = \text{Dose}_{\text{air}} + \text{Dose}_{\text{surface water}} + \text{Dose}_{\text{ground water}}$$

  - Exposure dose calculated for a receptor under a fixed set of environmental conditions, i.e., releases from a landfill reaching the receptor located 100 meters from the source.
  - Exposure dose calculated in three steps: (1) calculation of release rates from landfill to air, ground water, and surface water; (2) fate and transport modeling of steady-state concentrations at the exposure point; and (3) calculation of media-

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[9] Documentation reviewed:

Draft Interim Report on the Development of Numerical Hazard Ranking Scheme. April 19, 1984. Developed for the Office of Solid Waste by Environ Corp.

specific human intakes. (The surface water intake is estimated based on bioaccumulation in fish that is ingested.)

System Evaluation

Scope of coverage:

- System was applied to all listed hazardous wastestreams in 40 CFR Part 261, i.e., F, K, U, and P wastes.
- A composition profile was developed for each wastestream based on only those constituents in Appendix VII of 40 CFR Part 261.
- Documentation notes that the system was applied to approximately 450 wastestreams.

Media addressed:

- System is designed to provide rankings based on releases to air, surface water, and ground water.

Types of targeting criteria used:

- Targeting criteria include initial concentration of wastestream constituents and their toxicity. Initial concentrations dictate the release into various environmental media, and hence, the ultimate exposure dose. (See also Exhibit 1.)

Data requirements:

- System documentation provides a fair amount of detail on data sources, and methods for estimating some of the required parameter values.
- For waste composition information, system relied heavily on (1) data compiled for EPA's Risk-Cost Analysis Model and other "best available data" (for F and K wastes); and (2) assumptions about "typical upperbound concentrations at which commercial chemical products may become wastes" (for U and P wastes).
- For toxicity information, system relied first on available EPA ADIs and UCRs, and then on open literature, using human and animal toxicity data to derive ADIs and UCRs.

Applicability to waste minimization targeting:

Pros

- System directly applicable to RCRA wastestreams.

Cons

- Ranking is based on a fixed set of exposure conditions (i.e., assumptions regarding releases from a landfill and the location of the receptor).

- Uses certain conservative or "worst-case" simplifying assumptions for the fate and transport modeling (e.g., constant wind direction towards receptor, no decay of constituents in surface water).

- May not be as applicable for wastes destined for incineration because rankings appear to be driven by the ground-water pathway.

- Limited in targeting criteria, e.g., does not consider ecological toxicity, waste volume.

Exhibit L. Targeting Criteria Used in the Waste Scheduling Scheme.

TARGETING CRITERIA	
Direct Risks	
Waste volume	
Waste/constituent toxicity Human toxicity Ecological toxicity	✓
Constituent concentration or mass	✓
Waste type (e.g., solvents)	
Number of generators	
Waste management practices	
Releases to environmental media (e.g., simulated releases from waste management units)	✓[a]
Potential for constituent transport (based on physico-chemical properties)	✓[a]
Potential for cross-media transfer	
Potential for human exposure: residential settings occupational settings	✓[a]
Potential for ecological exposure	
Indirect or Acute Risks	
Ignitability, corrosivity, reactivity	
Ozone depletion potential	
Global warming	
Other Targeting Criteria	
Hazardous waste management capacity	
Technical/administrative feasibility	
Permitting/enforcement factors	
Cost savings	
Other factors	

[a] These are considered indirectly in modeling the exposure dose.

Risk-Based Enforcement Strategy (RBES)[10]

Purpose of the Methodology/System

- To rank sites for enforcement activities and assess the effectiveness of environmental laws in reducing risks at these sites.

System Description

- System developed through a cooperative effort between the Office of Research and Development (ORD) and the Office of Enforcement (OE).

- Ranks facilities based on a Chemical Ranking Factor (CRF), compliance history, and environmental vulnerability.

- CRF is essentially the summation of the toxicity-weighted annual chemical releases at a facility. (EPA selected this over a more complicated approach to calculate the CRF which instead relied on exposure-adjusted releases.)

- To score the CRF, system first selects facility or industrial sector to be ranked, and retrieves release information, on a facility-specific basis, from three EPA information systems:

  - Aerometric Information Retrieval System's Facility Subsystem (AFS-AIRS) -- a data base that contains data on major industrial, commercial, and municipal facilities required to report their emissions to EPA under the Clean Air Act. AFS-AIRS contains data primarily from SIC code 4911 (coal-burning and other power plants).

  - Permit Compliance System (PCS) -- an inventory for the National Pollutant Discharge Elimination (NPDES) program that includes permit and compliance information on regulated facilities (i.e., facilities discharging wastewater into navigable waterways). PCS contains data primarily from SIC code 4952 (sewage systems).

  - Toxic Release Inventory (TRI) contains data relating to manufacturing (SIC codes 2000-3999); facilities with at least 10 employees and that manufacture, process, or import at least 25,000 pounds of a TRI-listed chemical must file TRI reports. TRI primarily contains data from SIC codes 2000-3999 (manufacturing).

  These three information systems contain data about three different types of facilities; however, there is some overlap. In using the system, total TRI water and total TRI air releases are compared to those from PCS and AFS-AIRS, respectively, and the larger value for each media is selected.

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[10] Documentation reviewed:

Risk-Based Enforcement Strategy II, Draft Report Submitted to the Exposure Assessment Group, Office of Health and Environmental Assessment, U.S. EPA by Versar, Inc., September 30, 1993.

Contact: Karen Hammerstorm (202/260-8919)

- Second, the release data is linked to a toxicity data base, and each chemical is assigned a chemical toxicity score equal to the inverse of its reportable quantity (RQ).

- Third, each chemical release is multiplied by the chemical-specific toxicity score; chemical scores for a given media are summed to yield a media score.

- Finally, all media scores for a facility are summed to yield a facility score.

System Evaluation

Scope of coverage:

- Covers all facilities for which release information exists in the AFS-AIRS, PCS, and TRI national data bases.

- Covers chemicals that have EPA-assigned RQs, or have sufficient toxicity information that an RQ could be derived for purposes of this system.

Media addressed:

- System is designed to provide rankings based on releases to air, surface water, and land, both for on-site releases and off-site transfers

Types of targeting criteria used:

- Targeting criteria include annual chemical releases at facilities and the toxicity of the released chemicals, both of which are incorporated into the CRF. (Although "compliance history" and "environmental vulnerability" are also mentioned in the documentation as facility-level criteria, no mention is made of how they are incorporated into the final facility ranking.)

Data requirements:

- Uses release information available in the AFS-AIRS, PCS, and TRI national data bases.

- Uses chemical toxicity information stored in the toxicity data base developed specifically for this system.

Applicability to waste minimization targeting:

Pros

- System may be applied to sources such as hazardous waste sites, waste disposal facilities, or manufacturing facilities; uses release information from numerous data bases that cover several different types of facilities.

Cons

- System appears relatively new, not well documented, and not sufficiently tested.

- Relies on only toxicity and annual releases and does not directly address exposure.

Exhibit 1. Targeting Criteria Used in the Risk-Based Enforcement Strategy.

TARGETING CRITERIA	
Direct Risks	
Waste volume	
Waste/constituent toxicity Human toxicity Ecological toxicity	 ✓ ✓
Constituent concentration or mass	✓
Waste type (e.g., solvents)	
Number of generators	
Waste management practices	
Releases to environmental media	✓
Potential for constituent transport	
Potential for cross-media transfer	
Potential for human exposure: residential settings occupational settings	
Potential for ecological exposure	
Indirect or Acute Risks	
Ignitability, corrosivity, reactivity	
Ozone depletion potential	
Global warming	
Other Targeting Criteria	
Hazardous waste management capacity	
Technical/administrative feasibility	
Permitting/enforcement factors	
Cost savings	
Other factors	

Superfund Hazard Ranking System[11]

Purpose of the Methodology/System

- Used by EPA's Superfund program to assess the relative threat associated with actual or potential releases of hazardous substances.

- Primary screening tool for determining whether a site is to be included on the National Priorities List (NPL), which contains EPA's priorities for further investigation and possible remedial response action under Comprehensive Environmental Response, Compensation, and Liability Act (CERCLA).

System Description

- HRS site score determined by evaluating four pathways:

  -- ground water migration
  -- surface water migration
  -- air migration
  -- soil exposure

- Each pathway score based on a number of subcriteria, called 'factors', grouped into three primary criteria called 'factor categories':

  -- likelihood of release (for the soil exposure pathway, likelihood of exposure);
  -- waste characteristics; and
  -- targets (e.g., the people or sensitive environments affected by the release).

- Factor category scores are determined from evaluation of factors. They are multiplied together and then normalized to 100 points to obtain pathway score.

- Factors with larger associated relative threats may carry greater weight and will more strongly affect final scores (for example, in the targets factor category, the HRS gives

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[11]Documentation reviewed:

U.S. EPA. 1992. *Hazard Ranking System Guidance Manual.* Hazardous Site Evaluation Division, Office of Solid Waste and Emergency Response, U.S. Environmental Protection Agency, Washington, D.C., EPA 540-R-92-026.

U.S. EPA. 1990. *The Revised Hazard Ranking System: Background Information.* Hazardous Site Evaluation Division, Office of Solid Waste and Emergency Response, U.S. Environmental Protection Agency, Washington, D.C., Publication 9320.7-03FS.

Contact: Janet Grubbs (703/603-8833)

greater weight to actual exposures, such as to people whose drinking water is contaminated and to actual contamination of the aquatic human food chain).

- Site score is obtained by combining the four pathway scores in a root-mean-square equation:
  - -- root-mean-square approach gives more weight to higher scoring pathways
  - -- scores range from 0 to 100
  - -- score of 28.50 or greater qualifies site for the NPL.
- Exhibit 1 is a summary of the main criteria and subcriteria (i.e., factor categories and factors) considered in the four HRS pathways, and is organized by factor category.
- Factors in the HRS utilizing chemical-specific data in the scoring process:
  - -- human toxicity factor (in the waste characteristics factor category), intended to represent the relative potential of a substance to cause adverse health effects, based on three measures of toxicity in a tired approach:
    - cancer, based on cancer potency factors and weight-of-evidence (ED_{10} can also be usec
    - noncancer effects of chronic exposure, based on verified Reference Doses (RfDs)
    - acute toxicity, based on LD_{50}/LC_{50} data
  - -- hazardous waste quantity factor (in the waste characteristics factor category) based on hazardous constituent concentration data, mass of waste as deposited, volume, and/or surface area of the source.
  - -- several other chemical-specific waste characteristics factors include: persistence,. mobility, bioaccumulation, ecological toxicity
- Almost all factors in the likelihood of release and targets factor categories are exposure-related. For example:
  - -- observed release factor (in the likelihood of release factor category) based on a measured concentration of a hazardous substance in the environment to which a population is potentially exposed
  - -- targets factor category utilizes factors related to actual population exposures, which are depicted in Exhibit 1.

System Evaluation

Scope of Coverage:

- *Constituents*: HRS considers CERCLA hazardous substances as well as other pollutants or contaminants:

  -- hazardous substances defined in CERCLA section 101(14), which references substances specifically listed under other Federal laws.

  -- "pollutants or contaminants" broadly defined in CERCLA section 101(33) and could include any constituent reasonably anticipated to be harmful to human or ecological health; EPA determines on a case-by-case basis which substances fall within definition.

  -- available chemical data bases used in scoring (Superfund Chemical Data Matrix) focus on approximately 300 commonly encountered hazardous substances

- *Sources*: HRS considers "any area where a hazardous substance has been deposited, stored, disposed, or placed, plus those soils that may have become contaminated from hazardous substance migration", such as:

  -- above-ground and below-ground tanks
  -- contaminated soil (excluding land treatment)
  -- drums
  -- landfarms/land treatment
  -- surface impoundments

Media/pathways addressed:

- Ground water migration pathway

- Surface water migration pathway (overland/flood and ground water to surface water components)--divided into three threats: drinking water, human food chain, and environmental

- Soil exposure pathway--divided into two threats: resident population and the nearby population

- Air migration pathway

Types of targeting criteria used:

- The HRS scores a site using criteria based on human, environmental, and resource risk in multiple pathways. Key criteria in the HRS are summarized in Exhibit 2.

Data Requirements

- All available site information, which may include information from Preliminary Assessment and Site Inspection reports, should be collected by scorer and should include data on:

- -- primary sources or hazardous substances at the site
- -- the hazardous substances themselves and their quantities
- -- whether there are observed releases
- -- major targets (e.g., populations, municipal wells, fisheries, sensitive environments) located near the site
- -- whether any targets are exposed to actual contamination.

- Scorer should assess whether available information is sufficient to document all the HRS factors relevant to the site's score; additional data collection may be necessary to gain a better understanding of those factors critical to the site's HRS score.

- HRS accommodates various levels of data quality, and often provides default options when complete data is not available.

- Scorer should develop selective scoring strategy because it is usually not feasible to gather data for and score every factor in every pathway, and should consider the following:

  - -- a primary goal of HRS scoring is to determine whether or not the site is eligible for the NPL, i.e., if site score is greater than 28.50

  - -- sites often pose significant threats in only one or two pathways

  - -- higher-scoring pathways exert a proportionately greater influence on the site score than do lower-scoring pathways.

Applicability to Waste Minimization Targeting:

Pros

- HRS is comprehensive, e.g., addresses numerous criteria in four pathways, and thus may accurately assess threats associated with releases of hazardous substances (for example, HRS considers direct contact of people with contaminated soils, contamination of aquatic food chain, three broad types of human toxicity, potential for air contamination, sensitive environments that include wetlands, endangered species, and environments designated by various Federal and State agencies).

- HRS is the most carefully developed, thoroughly peer-reviewed, and widely applied of the targeting schemes to be reviewed under the waste minimization targeting effort. In the developmental stage of the HRS, components of the model were reviewed by the Science Advisory Board (SAB). Additionally, the final version of the HRS model is currently under review by the National Academy of Sciences. Carrying the weight of these reviews as well as public notice and comment, the HRS enjoys more regulatory and scientific credibility than the other schemes.

- HRS is considered to be a screening tool, not a detailed risk assessment, and is thus an appropriate targeting strategy.

Cons

- In 'full' form, HRS is relatively complex and data-intensive.
- HRS is site-oriented, not waste-oriented; the overall scores relate more to releases from sites and threats to nearby receptors. Some components of the HRS, however, may be useful to waste minimization targeting. For example, the waste characteristics factors, e.g., toxicity and persistence, can be used for scoring waste streams as generated.
- HRS is not specifically designed for generators of hazardous wastes.
- HRS is not designed to consider combustion or other treatment processes with respect to "quantitative release." An observed release has to be attributable to a source on the site in order to be scored; combustion and other active treatment units are not regarded as sources in the HRS.

Exhibit 1. Hazard Ranking System: Factors and Factor Categories

Pathway	Factor Categories		
	Likelihood of Release	**Waste Characteristics**	**Targets**
Ground Water Migration Pathway	**Observed** Release *or* **Potential to Release** **Containment** **Net Precipitation** **Depth to aquifer** **Travel time**	Toxicity/Mobility Hazardous Waste Quantity	Nearest Well Population Resources Wellhead Protection Area

Pathway	Factor Categories		
	Likelihood of Release	**Waste Characteristics**	**Targets**
Surface Water Migration Pathway	Overland Flood Component Observed Release *or* Potential to Release By Overland Flow: Containment Runoff Distance to Surface Water By Flood: Containment Flood Frequency Ground Water to Surface Water Component Observed Release *or* Potential to Release Containment Net Precipitation Depth to Aquifer Travel Time	Drinking Water Threat Toxicity/Persistence/Mobility Hazardous Waste Quantity Human Food Chain Threat Toxicity/Persistence/Mobility/ Bioaccumulation Hazardous Waste Quantity Environmental Threat Ecosystem Toxicity/Mobility/ Persistence/Bioaccumulation Hazardous Waste Quantity	Drinking Water Threat Nearest Intake Population Resources Human Food Chain Threat Food Chain Individual Population Environmental Threat Sensitive Environments

Exhibit 1 (continued). Hazard Ranking System: Factors and Factor Categories

Pathway	Factor Categories		
	Likelihood of Release	Waste Characteristics	Targets
Soil Exposure Pathway	Resident Population Threat Observed Contamination Nearby Population Threat Attractiveness/Accessibility Area of Contamination	Resident Population Threat Toxicity Hazardous Waste Quantity Nearby Population Threat Toxicity Hazardous Waste Quantity	Resident Population Threat Resident Individual Resident Population Workers Resources Terrestrial Sensitive Environments Nearby Population Threat Population Within 1 Mile Nearby Individual
Air Migration Pathway	Observed Release *or* Potential to Release Gas Gas Containment Gas Source Type Gas Migration Potential Particulate Particulate Containment Particulate Source Type Particulate Migration Potential	Toxicity/Mobility Hazardous Waste Quantity	Resources Population Within 4-Mile Radius Nearest Individual Sensitive Environments

Exhibit 2. Targeting Criteria Used in the Hazard Ranking System.

TARGETING CRITERIA	
Direct Risks	
Waste volume	✓
Waste/constituent toxicity Human toxicity Ecological toxicity	 ✓ ✓
Constituent concentration or mass	✓
Waste type (e.g., solvents)	
Number of generators	
Waste management practices	✓
Releases to environmental media	✓
Potential for constituent transport	✓
Potential for cross-media transfer	✓
Potential for human exposure: residential settings occupational settings	 ✓ ✓
Potential for ecological exposure	✓
Indirect or Acute Risks	
Ignitability, corrosivity, reactivity	
Ozone depletion potential	
Global warming	
Other Targeting Criteria	
Hazardous waste management capacity	
Technical/administrative feasibility	
Permitting/enforcement factors	
Cost savings	
Other factors Resource exposure (e.g., if aquifer being evaluated is used for drinking water or irrigation) Wellhead Protection Areas	 ✓ ✓

Toxics Release Inventory Environmental Indicators Methodology[12]

Purpose of the Methodology/System

- Proposed by EPA Office of Pollution Prevention and Toxics (OPPT) for use in tracking changes in human health and environmental risks posed by chemicals released to the environment.

- Will "allow EPA to measure its successes in implementing environmental protection and pollution prevention programs, and to formulate strategic plans for improving the course of future environmental progress."

System Description

- Calculates a national index of chronic health risks to human populations based on estimated exposures to environmental releases of TRI chemicals. Comparison of indices from year to year reveals whether risks are increasing or decreasing over time.

- Each facility-reported release of each TRI chemical to each environmental medium is weighted by toxicity, exposure potential, and the size of the exposed population to produce a risk-related "subindex." Basic steps:

  1. Determine location of TRI-reporting facility or facility that receives its wastes;

  2. Using a geographically-indexed database, match geographic and demographic features to facility location to derive site-specific environmental (e.g., stream velocity) and exposure (e.g., number of people using private drinking water wells) information for subsequent modeling;

  3. Estimate environmental concentrations at exposure points using TRI-reported release and generic and site-specific environmental and exposure information as input to mathematical models;

  4. From the exposure concentration, calculate dose using standard exposure assumptions;

  5. Assign exposure score based on calculated dose and degree of uncertainty;

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[12] Documentation reviewed:

U.S. EPA, May 22, 1992, *Toxics Release Inventory Environmental Indicators Methodology*, Draft Report prepared for the Office of Pollution Prevention and Toxics by Abt Associates, Inc.

Contact: Loren Hall (202/260-3931)

6. Multiply exposure score by size of exposed population and adjust for uncertainty; and

7. Multiply result by toxicity score reflecting chemical's potency and weight-of-evidence classification.

- Subindices for about 500,000 combinations of facility, chemical, and medium are summed to derive the national index.

- Five types of direct TRI releases (or "media") covered: air releases, surface water releases, on-site land releases, discharge to POTWs, and off-site transfers. The methodology for incorporating exposure into the indicator considers cross-media transfers also.

- Methods for estimating exposures to different types of releases vary significantly in level of rigor and use of generic vs. site-specific data.

System Evaluation

Scope of coverage:

- The TRI indicator includes all facility-reported releases of TRI chemicals (about 240-320 chemicals) to the environment, except those meeting certain criteria for exclusion.

- Based on certain criteria, some TRI chemicals proposed to be excluded from the TRI indicator (e.g., non-TSCA chemicals, chemicals with no reporting or zero reporting)

Media/pathways addressed:

- Air releases:
  - -- Inhalation exposure

- Surface water releases:
  - -- Drinking water (surface water)
  - -- Fish ingestion

- Discharge to POTWs:
  - -- Effluent:
    - Drinking water (surface water)
    - Fish ingestion
  - -- Treatment:
    - Volatilization/inhalation
  - -- Sludge management:
    - Route depends on management practice

- On-site land releases:

  - Drinking water (ground water)
  - Volatilization/inhalation (actually reported under TRI air releases and handled along with other air releases)
- – No release assumed if management is in a RCRA Subtitle C unit

- Off-site transfers:

  -- Incineration
     - Inhalation
  -- Land management
     - Volatilization/inhalation
     - Drinking water (ground water)
  -- No release assumed if management is in a RCRA Subtitle C unit

- Cross-media transfers considered. For instance, on-site releases include releases to landfills, surface impoundments, land treatment units and underground injection. To evaluate exposure from these releases, the indicator methodology models "cross-media" transfers also, e.g., leaching from landfill to groundwater and volatilization. For releases to POTWs, the methodology models volatilization and adsorbtion to and subsequent volatilization from sludge.

Types of targeting criteria used (see Exhibit 1):

- Overall measure: chronic health risks to human populations (not to individuals)

- Incorporates standard risk assessment factors and methods

Data requirements:

- Constituent toxicity (all endpoints specified in SARA Section 313): from IRIS; HEAST; structure/activity relationships and other methods

- Releases to environmental media: from TRI database

- Estimation of environmental concentrations and size of exposed population:

  - Site-specific data needs and sources:
    - Facility location from TRI
    - Geographically-indexed environmental and exposure information from "BGREACH" file, a SAS file developed for this project and housed on the EPA mainframe
    - RCRA regulatory status from TRI database, RCRIS
  - Generic inputs/default values derived using professional judgment and information from other EPA studies

Applicability to waste minimization targeting:

Pros

- System is designed to be used in tracking successes in pollution prevention and therefore seems appropriate for use in waste minimization/pollution prevention targeting.

- Cross-media transfers are covered.

- Subindices can be calculated to evaluate contribution to national index of individual chemicals, regions, states, industries, or release pathways.

- Method is based on standard risk assessment paradigm and is relatively rigorous.

Cons

- Very difficult to use system to track only hazardous waste-related releases and risks without major programming changes:

  -- Waste management in Subtitle C units is excluded (except for on-site incineration in Subtitle C units, which is handled along with other on-site air releases and may be difficult to separate out).

  -- Unclear whether incinerator ash management is covered at all.

- Methods for calculating exposures from land-based waste management are relatively unsophisticated and use mostly generic inputs (waste concentration calculated by dividing TRI-reported releases by industry-wide average annual waste generation; leachate concentrations using a partitioning approach; ground-water concentrations using a generic dilution and attenuation factor (DAF)).

- Ecological risks not covered, but are proposed to be added.

Exhibit 1. Targeting Criteria Used in the TRI Environmental Indicators Methodology.

TARGETING CRITERIA	
Direct Risks	
Waste volume	
Waste/constituent toxicity Human toxicity Ecological toxicity	 ✓ ✓
Constituent concentration or mass	✓
Waste type (e.g., solvents)	
Number of generators	
Waste management practices	✓
Releases to environmental media	✓
Potential for constituent transport	✓
Potential for cross-media transfer	✓
Potential for human exposure: residential settings occupational settings	 ✓
Potential for ecological exposure	
Indirect or Acute Risks	
Ignitability, corrosivity, reactivity	
Ozone depletion potential	
Global warming	
Other Targeting Criteria	
Hazardous waste management capacity	
Technical/administrative feasibility	
Permitting/enforcement factors	
Cost savings	
Other factors	

Toxics Release Inventory (TRI) Risk Screening Guide[13]

Purpose of the Methodology/System

- TRI - a national computerized data base containing data submitted by industry on the hazardous chemicals manufactured, used, stored, processed, or released to air, surface water, POTWs, or land.

- The TRI risk screening guide (system) is a framework for initial, screening-level analyses to identify, from among all TRI submissions for a particular geographical area or community, those risk scenarios, facilities, or chemicals for follow-up investigation.

System Description

- Qualitative or relative expression of risk (i.e., high, moderate, or low) derived by evaluating various chemical-specific and site-specific factors. These factors, listed in Exhibit 1, are evaluated in three different components that comprise the system:

  -- Toxicological potency. Incorporates measures of both the nature of the adverse human health or ecological effects (hazard identification) and the magnitude of these effects at specific exposure levels (dose-response relationships). Uses readily available EPA estimates of toxicological potency, which include reportable quantities (RQs), threshold planning quantities (TPQs), cancer potency factors, reference doses (RfDs), and ambient water quality criteria (AWQC).

  -- Exposure evaluation. Qualitatively evaluates data for two key aspects of exposure — plausible exposure pathways and potential environmental levels — based on site-specific and chemical-specific factors. The potential environmental levels refer to the characterization of amounts and concentrations of a chemical in the environment at points of contact with populations of interest.

  -- Risk characterization. Qualitatively combines the toxicological potency assessment and the exposure evaluation (i.e., in terms of relative probability of harm such as high, moderate, or trivial) to identify facilities, populations, and chemicals that warrant further investigation. Produces a profile of scores for each medium.

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[13] Documentation reviewed:

U.S. EPA. 1989. *Toxic Chemical Release Inventory Risk Screening Guide (Version 1.0), Volume I: The Process.* Prepared by the Office of Toxic Substances, U.S. Environmental Protection Agency, Washington, D.C., EPA 560/2-89-002.

Exhibit 1: Factors Used in TRI Risk Screening

Toxicological Potency Component	**Human Health Effects** • Carcinogenicity • Heritable gene and chromosome mutations • Neurotoxicity • Reproductive/developmental toxicity • Other chronic effects • Adverse acute effects	**Ecological Effects** • Environmental toxicity • Toxicity and persistence • Toxicity and bioaccumulation • Other significant effects	**Dose-response Relationships** • Properties of individual chemicals • Dose, frequency, & duration of exposure • Route of exposure • Other environmental exposures • Individually susceptibility

Exposure Evaluation Component	**Plausible Exposure Pathways** <u>Site-specific</u>: • Location of release • Population(s) exposed -human or ecological -size -sensitive subpopulations • Uses of contaminated media • Geographic distance to populations • Physical transport characteristics <u>Chemical-specific</u>: • Physical fate and transport characteristics • Environmental transformation characteristics	**Potential Environmental Levels** <u>Site-specific</u>: • Geographic distance to populations • Physical transport characteristics <u>Chemical-specific</u>: • Physical fate and transport characteristics • Environmental transformation characteristics • Rate of release • Quantity of release

Risk Characterization Component	• Qualitative combination of toxicological potency and exposure evaluation • Includes characterizing the nature of uncertainties and quality of data

System Evaluation

Scope of coverage:

- *Constituents*: Covers over 300 chemicals and/or chemical categories (i.e., components of mixtures) that are subject to TRI reporting.

- *Releases:* Covers releases from facilities:

  -- classified in Standard Industrial Classification (SIC) codes 20 through 39; and

  -- that employ the equivalent of 10 or more full-time individuals; and

  -- that manufacture (including import) or process any of the Section 313 chemicals or chemical categories in amounts greater than 75,000 pounds in 1987; 50,000 pounds in 1988; or 25,000 pounds in 1989 and subsequent years; or who use any listed chemical or chemical category in any other way (other than manufacture) in amounts greater than 10,000 pounds in 1987 and subsequent years, including processing or importing the listed chemical or chemical category.

  -- Only routine releases (i.e., releases occurring during normal industrial operation) are addressed; "burst" or accidental, rapid releases are not addressed.

Media addressed:

- All releases to:

  -- air (fugitive and point-source)
  -- land (injection, landfills, surface impounding, landspreading)
  -- surface water and publicly owned treatment works (POTW)

Types of targeting criteria used:

- Targeting based on human health and ecological risks, which in turn are assessed based on site- and chemical-specific factors listed in Exhibit 1.

- Local, State, and Federal laws, public concern, control technologies, economics, and politics are additional criteria that can be used in the risk-management phase to fully characterize risks from routine TRI releases.

- Exhibit 2 summarizes the key targeting criteria used in this system.

Data requirements:

- Data needed for the screening are less detailed than data required for a formal risk assessment.

- Relevant data are obtained from the TRI data base and from appendices to the risk screening guide.

- Supplementary information is required to fully characterize risks for TRI releases and to put these risks into perspective with those from other chemical releases in the community.

Applicability to Waste Minimization Targeting:

Pros

- System is a screening-level tool that conforms with the risk assessment paradigm.

- System documentation provides toxicity indices for TRI chemicals and methods to interpret and use TRI releases data.

Cons

- System is designed around TRI data, which does not cover all chemicals, wastestreams, or industrial sectors. For example, not all industrial releases of listed chemicals are covered by the TRI reporting requirements (facilities with fewer than 10 employees, industries outside the specified SIC codes, and industries using less than the threshold quantities).

- Release data is difficult to use for exposure modeling. Releases reported by industry are summary data reported in pounds per year; no specific information on frequency, duration, concentration, or peak release is required. Reporting form does not specify location of point sources or identity of chemicals comprising mixtures and compound classes.

Exhibit 2: Targeting Criteria Used in the TRI Risk Screening Guide

TARGETING CRITERIA	
Direct Risks	
Waste volume (pounds)	✓
Waste/constituent toxicity Human toxicity Ecological toxicity	 ✓ ✓
Constituent concentration	
Waste type	
Number of generators	
Waste management practices	
Releases to environmental media	✓
Potential for constituent transport	✓
Potential for cross-media transfer	
Potential for human exposure: environmental settings occupational settings	 ✓ ✓
Potential for ecological exposure	
Indirect or Acute Risks	
Ignitability, corrosivity, reactivity	
Ozone depletion potential	
Global warming	
Other Targeting Criteria	
Hazardous waste management capacity	
Technical/administrative feasibility	
Permitting/enforcement factors	✓
Cost savings	
Other factors	

APPENDIX 8
HRS HAZARD DATA AND PATHWAY SCORES FROM SUPERFUND CHEMICAL DATA MATRIX

Exhibit 1 HRS Hazard Data and Pathway Scores for Halogenated Organics

Chemical	HRS Pathway Scores										
	CAS No	Toxicity	GW Mob	Air Mob	Persist	FCBioacc	EnvBioacc	Ecotox	GW (Tox/Mob)	Air (Tox/Mob)	SW/OP/DWT (Tox/Per)
1,1,1,2-tetrachloroethane	630-20-6	1.00E+02	1.00E-02	1.00E+00	4.00E-01	5.00E+01	5.00E+01	1.00E+01	1.00E+00	1.00E+02	4.00E+01
1,1,1-trichloroethane	71-55-6	1.00E+01	1.00E-02	1.00E+00	4.00E-01	5.00E+00	5.00E+00	1.00E+01	1.00E-01	1.00E+01	4.00E+00
1,1,2,2-tetrachloroethane	79-34-5	1.00E+01	1.00E-02	1.00E+00	4.00E-01	5.00E+00	5.00E+00	1.00E+02	1.00E-01	1.00E+01	4.00E+00
1,1,2-trichloroethane	79-00-5	1.00E+03	1.00E-02	1.00E+00	4.00E-01	5.00E+01	5.00E+01	1.00E+01	1.00E+01	1.00E+03	4.00E+02
1,1,2-trichloro-1,2,2-trifluoroethane	76-13-1	1.00E+00	1.00E-02	1.00E+00	4.00E-01	5.00E+01	5.00E+01	NV	1.00E-02	1.00E+00	4.00E-01
1,1-dichloroethane	75-34-3	1.00E+01	1.00E+00	1.00E+00	4.00E-01	5.00E+00	5.00E+00	NV	1.00E+01	1.00E+01	4.00E+00
1,1-dichloroethylene	75-35-4	NV	NV	NV	NV	NV	NV	NV	NV	NV	NV
1,2,3-trichloropropane	96-18-4	1.00E+02	1.00E-02	1.00E+00	4.00E-01	5.00E+00	5.00E+00	1.00E+01	1.00E+00	1.00E+02	4.00E+01
1,2,4,5-tetrachlorobenzene	95-94-3	1.00E+04	1.00E-04	2.00E-01	1.00E+00	5.00E+03	5.00E+03	1.00E+02	1.00E+00	2.00E+03	1.00E+04
1,2,4-trichlorobenzene	120-82-1	1.00E+02	1.00E-02	1.00E+00	4.00E-01	5.00E+02	5.00E+02	1.00E+03	1.00E+00	1.00E+02	4.00E+01
1,2-dibromoethane	106-93-4	1.00E+04	1.00E+00	1.00E+00	4.00E-01	5.00E+00	5.00E+00	NV	1.00E+04	1.00E+04	4.00E+03
1,2-dibromo-3-chloropropane	96-12-8	1.00E+04	1.00E-02	1.00E+00	1.00E+00	5.00E+01	5.00E+01	NV	1.00E+02	1.00E+04	1.00E+04
1,2-dichlorobenzene	95-50-1	1.00E+01	1.00E-02	1.00E+00	4.00E-01	5.00E+01	5.00E+01	1.00E+02	1.00E-01	1.00E+01	4.00E+00
1,2-dichloroethane	107-06-2	1.00E+02	1.00E+00	1.00E+00	4.00E-01	5.00E+00	5.00E+00	1.00E+00	1.00E+02	1.00E+02	4.00E+01
1,2-dichloroethylene	156-60-5	NV	NV	NV	NV	NV	NV	NV	NV	NV	NV
1,2-dichloropropane	78-87-5	1.00E+03	1.00E+00	1.00E+00	4.00E-01	5.00E+01	5.00E+01	1.00E+01	1.00E+03	1.00E+03	4.00E+02
1,3-dichlorobenzene	541-73-1	NV	1.00E-02	1.00E+00	4.00E-01	5.00E+01	5.00E+01	1.00E+02	NV	NV	NV
1,3-dichloropropene	542-75-6	1.00E+04	1.00E+00	1.00E+00	4.00E-01	5.00E+00	5.00E+00	1.00E+03	1.00E+04	1.00E+04	4.00E+03
1,4-dichlorobenzene	106-46-7	1.00E+01	1.00E-02	1.00E+00	4.00E-01	5.00E+01	5.00E+01	1.00E+02	1.00E-01	1.00E+01	4.00E+00
2,3,4,6-tetrachlorophenol	58-90-2	1.00E+02	1.00E-04	2.00E-01	1.00E+00	5.00E+02	5.00E+03	1.00E+03	1.00E-02	2.00E+01	1.00E+02
2,4,5-TP (Silvex)	93-72-1	1.00E+02	1.00E-02	2.00E-03	4.00E-01	5.00E+02	5.00E+02	1.00E+04	NV	2.00E-01	4.00E+01
2,4,5-trichlorophenol	95-95-4	1.00E+01	1.00E-02	2.00E-01	1.00E+00	5.00E+02	5.00E+03	1.00E+03	1.00E-01	2.00E+00	1.00E+01
2,4,6-trichlorophenol	88-06-2	1.00E+01	1.00E+00	2.00E-01	1.00E+00	5.00E+02	5.00E+04	1.00E+03	1.00E+01	2.00E+00	1.00E+01
2,4-D	94-75-7	1.00E+02	1.00E-02	2.00E-03	1.00E+00	5.00E+01	5.00E+01	1.00E+02	NV	2.00E-01	1.00E+02
2,4-dichlorophenol	120-83-2	1.00E+03	1.00E-02	2.00E-01	1.00E+00	5.00E+02	5.00E+02	1.00E+02	1.00E+01	2.00E+02	1.00E+03
2-chloroethylvinylether	110-75-8	1.00E+04	1.00E+00	1.00E+00	4.00E-01	5.00E-01	5.00E-01	1.00E+01	1.00E+04	1.00E+04	4.00E+03
2-chloronaphthalene	91-58-7	1.00E+01	1.00E-04	1.10E+01	1.00E+00	5.00E+02	5.00E+02	NV	1.00E-03	1.10E+02	1.00E+01
2-chlorophenol	95-57-8	1.00E+02	1.00E-02	1.00E+00	4.00E-01	5.00E+02	5.00E+02	1.00E+02	NV	1.00E+02	4.00E+01
3,3-dichlorobenzidine	91-94-1	1.00E+02	1.00E-04	2.00E-04	1.00E+00	5.00E+02	5.00E+02	NV	1.00E-02	2.00E-02	1.00E+02
acenaphthene	83-32-9	1.00E+01	1.00E-02	2.00E-01	4.00E-01	5.00E+02	5.00E+02	1.00E+04	1.00E-01	2.00E+00	4.00E+00
acenaphthylene	208-96-8	NV	1.00E-02	2.00E-02	1.00E+00	5.00E+02	5.00E+02	NV	NV	NV	NV
acetaldehyde	75-07-0	1.00E+03	1.00E+00	1.00E+00	4.00E-01	5.00E-01	5.00E-01	1.00E+01	1.00E+03	1.00E+03	4.00E+02
acetone	67-64-1	1.00E+01	1.00E+00	1.00E+00	4.00E-01	5.00E-01	5.00E-01	1.00E+02	1.00E+01	1.00E+01	4.00E+00
acetonitrile	75-05-8	1.00E+02	1.00E+00	1.00E+00	1.00E+00	5.00E-01	5.00E-01	1.00E+00	1.00E+02	1.00E+02	1.00E+02
acetophenone	98-86-2	1.00E+01	1.00E+00	1.00E+00	4.00E-01	5.00E+00	5.00E+00	1.00E+00	1.00E+01	1.00E+01	4.00E+00
acrolein	107-02-8	1.00E+04	1.00E+00	1.00E+00	4.00E-01	5.00E+02	5.00E+02	1.00E+04	1.00E+04	1.00E+04	4.00E+03
acrylamide	79-06-1	1.00E+03	1.00E+00	2.00E-01	4.00E-01	5.00E+00	5.00E+00	1.00E+01	1.00E+03	2.00E+02	4.00E+02
acrylic acid	79-10-7	1.00E+03	1.00E+00	1.00E+00	1.00E+00	5.00E-01	5.00E-01	NV	1.00E+03	1.00E+03	1.00E+03
acrylonitrile	107-13-1	1.00E+03	1.00E+00	1.00E+00	4.00E-01	5.00E+01	5.00E+01	1.00E+02	1.00E+03	1.00E+03	4.00E+02
allyl chloride	107-05-1	NV	NV	NV	NV	NV	NV	NV	NV	NV	NV
alpha-BHC	319-84-6	NV	NV	NV	NV	NV	NV	NV	NV	NV	NV
ammonia	7664-41-7	1.00E+02	1.00E+00	1.00E+00	7.00E-04	5.00E-01	5.00E-01	1.00E+01	1.00E+02	1.00E+02	7.00E-02
aniline	62-53-3	1.00E+04	1.00E+00	1.00E+00	1.00E+00	5.00E+00	5.00E+02	1.00E+04	1.00E+04	1.00E+04	1.00E+04
anthracene	120-12-7	1.00E+01	1.00E-04	2.00E-03	4.00E-01	5.00E+03	5.00E+03	1.00E+04	1.00E-03	2.00E-02	4.00E+00

Exhibit 1. HRS Hazard Data and Pathway Scores for Halogenated Organics

Chemical	HRS Pathway Scores										
	CAS No	Toxicity	GW Mob	Air Mob	Persist	BCBioacc	EnvBioacc	Ecotox	GW (Tox/Mob)	Air (Tox/Mob)	SW/OP/DWT (Tox/Per)
aroclor 1016	12674-11-2	NV	NV	NV	NV	NV	NV	NV	NV	NV	NV
aroclor 1221	11104-28-2	NV	NV	NV	NV	NV	NV	NV	NV	NV	NV
aroclor 1232	11141-16-5	NV	NV	NV	NV	NV	NV	NV	NV	NV	NV
aroclor 1248	12672-29-6	NV	NV	NV	NV	NV	NV	NV	NV	NV	NV
aroclor 1254	11097-69-1	NV	NV	NV	NV	NV	NV	NV	NV	NV	NV
aroclor 1260	11096-82-5	NV	NV	NV	NV	NV	NV	NV	NV	NV	NV
benz(a)anthracene	56-55-3	1.00E+03	1.00E-04	2.00E-04	1.00E+00	5.00E+04	5.00E+04	1.00E+04	1.00E-01	2.00E-01	1.00E+03
benzene	71-43-2	1.00E+02	1.00E+00	1.00E+00	4.00E-01	5.00E+03	5.00E+02	1.00E+03	1.00E+02	1.00E+02	4.00E+01
benzo(a)pyrene	50-32-8	1.00E+04	1.00E-04	2.00E-04	1.00E+00	5.00E+04	5.00E+04	1.00E+04	1.00E+00	2.00E+00	1.00E+04
benzo(b)fluoranthene	207-08-9	NV	1.00E-04	2.00E-04	1.00E+00	5.00E+04	5.00E+04	NV	NV	NV	NV
benzyl chloride	100-44-7	1.00E+02	1.00E-02	1.00E+00	7.00E-02	5.00E+01	5.00E+01	1.00E+02	NV	1.00E+02	7.00E+00
beta-BHC	319-85-7	NV	NV	NV	NV	NV	NV	NV	NV	NV	NV
bis (2-chloroethoxyl) methane	111-91-7	1.00E+02	1.00E+00	6.00E+00	1.00E+00	5.00E-01	5.00E-01	NV	1.00E+02	6.00E+02	1.00E+02
bis (2-ethylhexyl) phthalate	117-81-7	1.00E+02	1.00E-04	2.00E-03	1.00E+00	5.00E+02	5.00E+04	1.00E+03	1.00E-02	2.00E-01	1.00E+02
bromodichloromethane	75-27-4	1.00E+02	1.00E-02	1.00E+00	4.00E-01	5.00E+01	5.00E+01	NV	NV	1.00E+02	4.00E+01
bromoform	75-25-2	NV	NV	NV	NV	NV	NV	NV	NV	NV	NV
bromomethane	74-83-9	1.00E+03	1.00E-02	1.00E+00	4.00E-01	5.00E+00	5.00E+00	1.00E+04	1.00E+01	1.00E+03	4.00E+02
carbon disulfide	75-15-0	1.00E+03	1.00E-02	1.00E+00	4.00E-01	5.00E+01	5.00E+01	1.00E+02	1.00E+01	1.00E+03	4.00E+02
carbon tetrachloride	56-23-5	1.00E+03	1.00E-02	1.00E+00	4.00E-01	5.00E+01	5.00E+01	1.00E+02	1.00E+01	1.00E+03	4.00E+02
chloral	75-87-6	1.00E+03	1.00E+00	1.10E+01	1.00E+00	5.00E+00	5.00E+00	NV	1.00E+03	1.10E+04	1.00E+03
chlordane	57-74-9	1.00E+04	1.00E-04	6.00E+00	1.00E+00	5.00E+04	5.00E+04	1.00E+04	NV	6.00E+04	1.00E+04
chlorobenzene	108-90-7	1.00E+02	1.00E-02	1.70E+01	7.00E-04	5.00E+01	5.00E+01	1.00E+03	NV	1.70E+03	7.00E-02
chloroethane	75-00-3	1.00E+00	1.00E+00	1.00E+00	7.00E-04	5.00E+00	5.00E+00	NV	1.00E+00	1.00E+00	7.00E-04
chloroform	67-66-3	1.00E+02	1.00E+00	1.70E+01	4.00E-01	5.00E+00	5.00E+00	1.00E+01	1.00E+02	1.70E+03	4.00E+01
chloromethane	74-87-3	1.00E+01	1.00E+00	1.70E+01	7.00E-04	5.00E+00	5.00E+00	1.00E+00	1.00E+01	1.70E+02	7.00E-03
chloromethyl methyl ether	107-30-2	1.00E+03	1.00E+00	1.70E+01	7.00E-04	5.00E-01	5.00E-01	NV	1.00E+03	1.70E+04	7.00E-01
cresol (m-cresol) *	108-39-4	1.00E+01	1.00E-02	1.00E+00	1.00E+00	5.00E+00	5.00E+00	1.00E+02	1.00E-01	1.00E+01	1.00E+01
crysene	218-01-9	NV	1.00E-04	2.00E-04	1.00E+00	5.00E+02	5.00E+03	1.00E+03	NV	NV	NV
cumene	98-82-8	1.00E+03	1.00E-02	1.00E+00	4.00E-01	5.00E+02	5.00E+02	1.00E+02	1.00E+01	1.00E+03	4.00E+02
cyanogen chloride	506-77-4	NV	NV	NV	NV	NV	NV	NV	NV	NV	NV
cyclohexanone	108-94-1	1.00E+00	1.00E+00	1.00E+00	1.00E+00	5.00E+00	5.00E+00	1.00E+00	1.00E+00	1.00E+00	1.00E+00
DDD	72-54-8	1.00E+02	1.00E-04	2.00E-03	1.00E+00	5.00E+04	5.00E+04	1.00E+04	1.00E-02	2.00E-01	1.00E+02
DDT	50-29-3	1.00E+03	1.00E-04	2.00E-03	1.00E+00	5.00E+04	5.00E+04	1.00E+04	1.00E-01	2.00E+00	1.00E+03
dichlorodifluoromethane	75-71-8	1.00E+01	1.00E-02	1.00E+00	4.00E-01	5.00E+01	5.00E+01	NV	1.00E-01	1.00E+01	4.00E+00
dichloroethyl ether	111-44-4	NV	NV	NV	NV	NV	NV	NV	NV	NV	NV
dichloroisopropyl ether	108-60-1	NV	NV	NV	NV	NV	NV	NV	NV	NV	NV
dichloromethyl ether	542-88-1	NV	NV	NV	NV	NV	NV	NV	NV	NV	NV
dieldrin	60-57-1	1.00E+04	1.00E-04	2.00E-03	1.00E+00	5.00E+04	5.00E+04	1.00E+04	NV	2.00E+01	1.00E+04
diphenyl nitrosamine	86-30-6	1.00E+01	1.00E-02	2.00E-02	1.00E+00	5.00E+02	5.00E+02	1.00E+02	1.00E-01	2.00E-01	1.00E+01
epichlorohydrin	106-89-8	NV	NV	NV	NV	NV	NV	NV	NV	NV	NV
ethyl acetate	141-78-6	1.00E+00	1.00E+00	1.00E+00	4.00E-01	5.00E-01	5.00E-01	1.00E+00	1.00E+00	1.00E+00	4.00E-01
ethyl benzene	100-41-4	1.00E+01	1.00E-02	1.00E+00	4.00E-01	5.00E+01	5.00E+01	1.00E+02	1.00E-01	1.00E+01	4.00E+00
ethylene dibromide	106-93-4	NV	NV	NV	NV	NV	NV	NV	NV	NV	NV
ethylene glycol	107-21-1	1.00E+00	1.00E+00	2.00E-01	1.00E+00	5.00E-01	5.00E-01	1.00E+01	1.00E+00	2.00E-01	4.00E+00

Exhibit 1 HRS Hazard Data and Pathway Scores for Halogenated Organics

Chemical	HRS Pathway Scores										
	CAS No	Toxicity	GW Mob	Air Mob	Persist	PCBioacc	EnvBioacc	Ecotox	GW (Tox/Mob)	Air (Tox/Mob)	SW/OP/DWT (Tox/Per)
ethylene glycol monomethyl ether	110-80-5	1.00E+01	1.00E+00	1.00E+00	1.00E+00	5.00E-01	5.00E-01	1.00E+00	1.00E+01	1.00E+01	1.00E+01
ethyl ether	60-29-7	1.00E+01	1.00E+00	1.00E+00	4.00E-01	5.00E-01	5.00E-01	1.00E+00	1.00E+01	1.00E+01	4.00E+00
fluoranthene	206-44-0	1.00E+02	1.00E-04	2.00E-04	1.00E+00	5.00E+03	5.00E+03	1.00E+04	1.00E-02	2.00E-02	1.00E+02
fluorene	86-73-7	1.00E+02	1.00E-02	2.00E-01	1.00E+00	5.00E+03	5.00E+03	1.00E+03	NV	2.00E+01	1.00E+02
formaldehyde	50-00-0	1.00E+01	1.00E+00	1.60E+00	1.00E+00	5.00E-01	5.00E-01	1.00E+02	1.00E+01	1.00E+01	1.00E+01
heptachlor	76-44-8	1.00E+03	2.00E-02	2.00E-02	1.00E+00	5.00E+03	5.00E+04	1.00E+04	2.00E+01	2.00E+01	1.00E+03
heptachlor epoxide	1024-57-3	1.00E+04	1.00E+00	2.00E-02	1.00E+00	5.00E+00	5.00E+04	1.00E+04	1.00E+04	2.00E+02	1.00E+04
hexachlorobenzene	118-74-1	1.00E+03	1.00E-04	2.00E-02	1.00E+00	5.00E+03	5.00E+04	1.00E+01	1.00E 01	2.00E+01	1.00E+03
hexachlorobutadiene (hexachloro-1,3-butadiene)	87-68-3	1.00E+03	1.00E-04	2.00E-01	1.00E+00	5.00E+01	5.00E+03	1.00E+04	1.00E-01	2.00E+02	1.00E+03
hexachlorocyclopentadiene	77-47-4	1.00E+04	1.00E-02	2.00E-01	1.00E+00	5.00E+03	5.00E+01	1.00E+04	1.00E+02	2.00E+03	1.00E+04
hexachloroethane	67-72-1	1.00E+03	1.00E-02	1.00E+00	4.00E-01	5.00E+02	5.00E+02	1.00E+03	1.00E+01	1.00E+03	4.00E+02
hexachloropentadiene	77-47-4	1.00E+04	1.00E-02	2.00E-01	1.00E+00	5.00E+03	5.00E+01	1.00E+04	1.00E+02	2.00E+03	1.00E+04
hydrochloric acid	7647-01-0	1.00E+03	1.00E+00	NV	4.00E-01	5.00E-01	5.00E-01	1.00E+00	1.00E+03	NV	4.00E+02
hydrogen sulfide	7783-06-4	1.00E+04	1.00E+00	1.00E+00	4.00E-01	5.00E-01	5.00E-01	1.00E+03	1.00E+04	1.00E+04	4.00E+03
isobutanol	78-83-1	1.00E+01	1.00E+00	1.00E+00	4.00E-01	5.00E-01	5.00E-01	1.00E+01	1.00E+01	1.00E+01	4.00E+00
lindane	58-89-9	1.00E+04	1.00E-03	2.00E-02	1.00E+00	5.00E+02	5.00E+02	1.00E+04	1.00E+01	2.00E+02	1.00E+04
methanol	67-56-1	1.00E+00	1.00E+00	1.00E+00	1.00E+00	5.00E-01	5.00E-01	1.00E+00	1.00E+00	1.00E+00	1.00E+00
methoxychlor	72-43-5	1.00E+02	1.00E-04	2.00E-03	1.00E+00	5.00E+04	5.00E+04	1.00E+04	1.00E-02	2.00E-01	1.00E+02
methyl chlorocarbonate	79-22-1	1.00E+02	NV	1.00E+00	4.00E-01	5.00E-01	5.00E-01	NV	NV	1.00E+02	4.00E+01
methylene bis(2-chloroaniline), 4,4	101-14-4	1.00E+03	1.00E-04	2.00E-04	4.00E-01	5.00E+02	5.00E+02	NV	1.00E-01	2.00E-01	4.00E+02
methylene chloride	75-09-2	1.00E+01	1.00E+00	1.00E+00	4.00E-01	5.00E+00	5.00E+00	1.00E+00	1.00E+01	1.00E+01	4.00E+00
methyl ethyl ketone	78-93-3	1.00E+01	1.00E+00	1.00E+00	4.00E-01	5.00E-01	5.00E-01	1.00E+00	1.00E+01	1.00E+01	4.00E+00
methyl isobutyl ketone	108-10-1	1.00E+01	1.00E+00	1.00E+00	4.00E-01	5.00E+00	5.00E+00	1.00E+00	1.00E+01	1.00E+01	4.00E+00
methyl methacrylate	80-62-6	1.00E+01	1.00E+00	1.00E+00	4.00E-01	5.00E+00	5.00E+00	1.00E+00	1.00E+01	1.00E+01	4.00E+00
n-butanol	71-36-3	1.00E+01	1.00E-02	1.00E+00	1.00E+00	5.00E+00	5.00E+00	1.00E+00	1.00E-01	1.00E+01	1.00E+01
naphthalene	91-20-3	1.00E+02	1.00E-02	2.00E-01	4.00E-01	5.00E+02	5.00E+02	1.00E+03	1.00E+00	2.00E+01	4.00E+01
nitrobenzene	98-95-3	1.00E+03	1.00E-02	1.00E+00	1.00E+00	5.00E+00	5.00E+00	5.00E+00	1.00E+01	1.00E+03	1.00E+03
pentachlorobenzene	608-93-5	1.00E+03	1.00E-02	2.00E-01	1.00E+00	5.00E+03	5.00E+03	1.00E+02	1.00E+01	2.00E+02	1.00E+03
pentachloroethane	76-01-7	1.00E+01	1.00E-02	1.00E+00	4.00E-01	5.00E+01	5.00E+01	1.00E+02	1.00E-01	1.00E+01	4.00E+00
pentachloronitrobenzene	82-68-8	1.00E+03	1.00E-02	2.00E-02	1.00E+00	5.00E+02	5.00E+02	NV	1.00E+01	2.00E+01	1.00E+03
pentachlorophenol	87-86-5	1.00E+02	1.00E-02	2.00E-02	1.00E+00	5.00E+02	5.00E+02	1.00E+02	NV	2.00E+00	1.00E+02
p-Chloroaniline	106-47-8	1.00E+03	1.00E+00	1.10E+01	1.00E+00	5.00E+00	5.00E+00	1.00E+04	1.00E+03	1.10E+04	1.00E+03
phenanthrene	85-01-8	NV	1.00E-04	2.00E-02	4.00E-01	5.00E+01	5.00E+03	1.00E+03	NV	NV	NV
phenol	108-95-2	1.00E+00	1.00E+00	1.00E+00	1.00E+00	5.00E+00	5.00E+00	1.00E+04	1.00E+00	1.00E+00	1.00E+00
pyrene	129-00-0	1.00E+02	1.00E-04	2.00E-03	1.00E+00	5.00E+01	5.00E+01	NV	1.00E-02	2.00E-01	1.00E+02
pyridine	110-86-1	1.00E+03	1.00E+00	1.00E+00	1.00E+00	5.00E-01	5.00E-01	1.00E+02	1.00E+03	1.00E+03	1.00E+03
styrene	100-42-5	1.00E+01	1.00E-02	1.00E+00	4.00E-01	5.00E+01	5.00E+01	1.00E+02	1.00E-01	1.00E+01	4.00E+00
sulfuric acid	7664-93-9	1.00E+03	1.00E+00	NV	4.00E-01	5.00E-01	5.00E-01	1.00E+01	1.00E+03	NV	4.00E+02
toluene	108-88-3	1.00E+01	1.00E-02	1.00E+00	4.00E-01	5.00E+01	5.00E+01	1.00E+02	1.00E-01	1.00E+01	4.00E+00
toxaphene	8001-35-2	1.00E+03	1.00E-02	2.00E-03	1.00E+00	5.00E+04	5.00E+04	1.00E+04	1.00E+01	2.00E+00	1.00E+03
tetrachloroethane	127-18-4	1.00E+02	1.00E-02	1.00E+00	4.00E-01	5.00E+01	5.00E+01	1.00E+02	1.00E+00	1.00E+02	4.00E+01
tetrahydrofuran	109-99-9	1.00E+00	1.00E+00	1.00E+00	1.00E+00	5.00E+02	5.00E+02	NV	1.00E+00	1.00E+00	1.00E+00
trans-1,2-dichloroethylene	156-60-5	1.00E+02	1.00E+00	1.00E+00	4.00E-01	5.00E+01	5.00E+01	1.00E+00	1.00E+02	1.00E+02	4.00E+01
trichloroethylene	79-01-6	1.00E+01	1.00E-02	1.00E+00	4.00E-01	5.00E+01	5.00E+01	1.00E+02	1.00E-01	1.00E+01	4.00E+00

Exhibit 1 HRS Hazard Data and Pathway Scores for Halogenated Organics

Chemical	HRS Pathway Scores										
	CAS No	Toxicity	GW Mob	Air Mob	Persist	FCBioacc	EnvBioacc	Ecotox	GW (Tox/Mob)	Air (Tox/Mob)	SW/OF/DWT (Tox/Per)
trichloromonofluoromethane	75 69 4	NV	NV	NV	NV	NV	NV	NV	NV	NV	NV
vinyl chloride	75-01-4	1 00E+04	1 00E-02	1 00E+00	7.00E-03	5 00E+00	5 00E+00	NV	1 00E+02	1 00E+04	7 00E+01
xylene (m-xylene) **	108-38-3	1 00E+00	1 00E-02	1 00E+00	4.00E-01	5 00E+02	5 00E+02	1 00E+02	1 00E-02	1 00E+00	4.00E-01
xylene (p-xylene) **	106-42-3	1 00E+01	1 00E-02	1 00E+00	4 00E-01	5 00E+01	4 00E+01	1 00E+02	1 00E-01	1 00E+01	4.00E+00
2,4-Dimethyl phenol	0-0-0	1 00E+02	1 00E-02	2 00E-01	1 00E+00	5 00E+02	5 00E+02	1 00E+02	1 00E+00	2 00E+01	1.00E+02
Benzo(a)anthracene	0-0-0	1 00E+03	1 00E+00	2 00E-04	1.00E+00	5.00E+04	5 00E+04	1 00E+04	1 00E+03	2 00E-01	1.00E+03
Butyl benzyl phthalate	0-0-0	1 00E+01	1 00E-04	2.00E-03	1.00E+00	5 00E+02	5 00E+02	1.00E+02	1 00E-03	2.00E-02	1.00E+01
Dibenz(a,h) anthracene	0-0-0	1 00E+04	1.00E-04	NV	1.00E+00	5.00E+04	5.00E+04	NV	1.00E+00	NV	1.00E+04
Dimethyl phthalate	0-0-0	1 00E+00	1.00E-02	2 00E-01	1.00E+00	5.00E+01	5 00E+01	1.00E+01	1.00E-02	2.00E-01	1.00E+00
Fluorene	0-0-0	1 00E+01	1.00E+00	1 00E+00	4.00E-01	5 00E-01	5.00E-01	NV	1.00E+01	1 00E+01	4.00E+00
Maleic anhydride	0-0-0	1.00E+01	NV	1.00E+00	7.00E-04	5 00E-01	5.00E-01	1.00E+00	NV	1 00E+01	7.00E-03
Phorate	0-0-0	1.00E+04	1.00E-02	2.00E-02	1.00E+00	5.00E+02	5.00E+01	1.00E+04	1.00E+02	2.00E+02	1.00E+04
Phthalic anhydride	0-0-0	1.00E+00	1.00E+00	2.00E-02	4.00E-01	5 00E-01	5.00E-01	NV	1 00E+00	2.00E-02	4.00E-01
Toluene diisocyanate	0-0-0	1.00E+03	NV	2.00E-01	4.00E-01	5.00E-01	5.00E-01	1.00E+00	NV	2 00E+02	4.00E+02
2,3,7,8-Tetrachlorodibenzo(p)dioxin	0-0-0	1.00E+04	1.00E-04	2.00E-04	1.00E+00	5.00E+03	5.00E+03	NV	1 00E+00	2.00E+00	1 00E+04
2,4,5-Trichlorophenol	0-0-0	1 00E+01	1 00E-02	2.00E-01	1.00E+00	5 00E+02	5.00E+03	1.00E+03	1 00E-01	2.00E+00	1 00E+01
Dichlorodifluoromethane	0-0-0	1 00E+01	1 00E-02	1.00E+00	4.00E-01	5.00E+01	5.00E+01	NV	1 00E-01	1 00E+01	4.00E+00
Tetrachlorobenzene	0-0-0	1.00E+04	1 00E-04	2.00E-01	1.00E+00	5.00E+03	5.00E+03	1.00E+02	1 00E+00	2.00E+03	1.00E+04
Vinyl Chloride	0-0-0	1 00E+04	1 00E-02	1.00E+00	7.00E-04	5.00E+00	5.00E+00	NV	1.00E+02	1 00E+04	7 00E+00

Exhibit 1. HRS Hazard Data and Pathway Scores for Halogenated Organics

Chemical	HRS Pathway Scores					
	CAS No	SW/OF/HFC (Tox/Pers/Bio)	SW/OF/Env (Tox/Per/Bio)	SW/OW/DWT (Tox/Mob/Per)	SW/OW/HFC (Tox/Mob/Per/Bio)	SW/OW/Env (Tox/Mob/Per/Bio)
1,1,1,2-tetrachloroethane	630-20-6	2.00E+03	2.00E+02	4.00E-01	2.00E+01	2.00E+00
1,1,1-trichloroethane	71-55-6	2.00E+01	2.00E+01	4.00E-02	2.00E-01	2.00E-01
1,1,2,2-tetrachloroethane	79-34-5	2.00E+01	2.00E+02	4.00E-02	2.00E-01	2.00E+00
1,1,2-trichloroethane	79-00-5	2.00E+04	2.00E+02	4.00E+00	2.00E+02	2.00E+00
1,1,2-trichloro-1,2,2-trifluoroethane	76-13-1	2.00E+01	NV	4.00E-03	2.00E-01	NV
1,1-dichloroethane	75-34-3	2.00E+01	NV	4.00E+00	2.00E+01	NV
1,1-dichloroethylene	75-35-4	NV	NV	NV	NV	NV
1,2,3-trichloropropane	96-18-4	2.00E+02	2.00E+01	4.00E-01	2.00E+00	2.00E-01
1,2,4,5-tetrachlorobenzene	95-94-3	5.00E+07	5.00E+05	1.00E+00	5.00E+03	5.00E+01
1,2,4-trichlorobenzene	120-82-1	2.00E+04	2.00E+05	4.00E-01	2.00E+02	2.00E+03
1,2-dibromoethane	106-93-4	2.00E+04	NV	4.00E+03	2.00E+04	NV
1,2-dibromo-3-chloropropane	96-12-8	5.00E+05	NV	1.00E+02	5.00E+03	NV
1,2-dichlorobenzene	95-50-1	2.00E+02	2.00E+03	4.00E-02	2.00E+00	2.00E+01
1,2-dichloroethane	107-06-2	2.00E+02	2.00E+00	4.00E+01	2.00E+02	2.00E+00
1,2-dichloroethylene	156-60-5	NV	NV	NV	NV	NV
1,2-dichloropropane	78-87-5	2.00E+04	2.00E+02	4.00E+02	2.00E+04	2.00E+02
1,3-dichlorobenzene	541-73-1	NV	2.00E+03	NV	NV	2.00E+01
1,3-dichloropropene	542-75-6	2.00E+04	2.00E+03	4.00E+03	2.00E+04	2.00E+03
1,4-dichlorobenzene	106-46-7	2.00E+02	2.00E+03	4.00E-02	2.00E+00	2.00E+01
2,3,4,6-tetrachlorophenol	58-90-2	5.00E+04	5.00E+06	1.00E-02	5.00E+00	5.00E+02
2,4,5-TP (Silvex)	93-72-1	2.00E+04	2.00E+06	4.00E-01	2.00E+02	2.00E+04
2,4,5-trichlorophenol	95-95-4	5.00E+03	5.00E+06	1.00E-01	5.00E+01	5.00E+04
2,4,6-trichlorophenol	88-06-2	5.00E+03	5.00E+07	1.00E+01	5.00E+03	5.00E+07
2,4-D	94-75-7	5.00E+03	5.00E+03	1.00E+00	5.00E+01	5.00E+01
2,4-dichlorophenol	120-83-2	5.00E+05	5.00E+04	1.00E+01	5.00E+03	5.00E+02
2-chloroethyloxirane	106-89-8	2.00E+03	2.00E+00	4.00E+03	2.00E+03	2.00E+00
2-chloronaphthalene	91-58-7	5.00E+03	NV	1.00E-03	5.00E-01	NV
2-chlorophenol	95-57-8	2.00E+04	2.00E+04	4.00E-01	2.00E+02	2.00E+02
3,3-dichlorobenzidine	91-94-1	5.00E+04	NV	1.00E-02	5.00E+00	NV
acenaphthene	83-32-9	2.00E+03	2.00E+06	4.00E-02	2.00E+01	2.00E+04
acenaphthylene	208-96-8	NV	NV	NV	NV	NV
acetaldehyde	75-07-0	2.00E+02	2.00E+00	4.00E+02	2.00E+02	2.00E+00
acetone	67-64-1	2.00E+00	2.00E+01	4.00E+00	2.00E+00	2.00E+01
acetonitrile	75-05-8	5.00E+01	5.00E-01	1.00E+02	5.00E+01	5.00E-01
acetophenone	98-86-2	2.00E+01	2.00E+00	4.00E+00	2.00E+01	2.00E+00
acrolein	107-02-8	2.00E+06	2.00E+06	4.00E+03	2.00E+06	2.00E+06
acrylamide	79-06-1	2.00E+03	2.00E+01	4.00E+02	2.00E+03	2.00E+01
acrylic acid	79-10-7	5.00E+02	NV	1.00E+03	5.00E+02	NV
acrylonitrile	107-13-1	2.00E+04	2.00E+03	4.00E+02	2.00E+04	2.00E+03
allyl chloride	107-05-1	NV	NV	NV	NV	NV
alpha-BHC	319-84-6	NV	NV	NV	NV	NV
ammonia	7664-41-7	3.50E-02	3.50E-03	7.00E-02	3.50E-02	3.50E-03
aniline	62-53-3	5.00E+04	5.00E+06	1.00E+04	5.00E+04	5.00E+06
anthracene	120-12-7	2.00E+04	2.00E+07	4.00E-04	2.00E+00	2.00E+03

Exhibit 1 HRS Hazard Data and Pathway Scores for Halogenated Organics

Chemical	CAS No	HRS Pathway Scores				
		SW/OP/HFC (Tox/Pers/Bio)	SW/OP/Env (Tox/Per/Bio)	SW/GW/DWT (Tox/Mob/Per)	SW/GW/HFC (Tox/Mob/Per/Bio)	SW/GW/Env (Tox/Mob/Per/Bio)
aroclor 1016	12674-11-2	NV	NV	NV	NV	NV
aroclor 1221	11104-28-2	NV	NV	NV	NV	NV
aroclor 1232	11141-16-5	NV	NV	NV	NV	NV
aroclor 1248	12672-29-6	NV	NV	NV	NV	NV
aroclor 1254	11097-69-1	NV	NV	NV	NV	NV
aroclor 1260	11096-82-5	NV	NV	NV	NV	NV
benz(a)anthracene	56-55-3	5 00E+07	5 00E+08	1.00E-01	5.00E+03	5 00E+04
benzene	71-43-2	2 00E+05	2 00E+05	4.00E+01	2 00E+05	2 00E+05
benzo(a)pyrene	50-32-8	5 00E+08	5.00E+08	1 00E+00	5.00E+04	5.00E+04
benzo(k)fluoranthene	207-08-9	NV	NV	NV	NV	NV
benzyl chloride	100-44-7	3.50E+02	3.50E+02	7.00E-02	3.50E+00	3.50E+00
beta-BHC	319-85-7	NV	NV	NV	NV	NV
bis (2-chloroethoxyl) methane	111-91-7	5 00E+01	NV	1 00E+02	5 00E+01	NV
bis (2-ethylhexyl) phthalate	117-81-7	5 00E+04	5.00E+07	1.00E-02	5 00E+00	5.00E+03
bromodichloromethane	75-27-4	2.00E+03	NV	4 00E-01	2.00E+01	NV
bromoform	75-25-2	NV	NV	NV	NV	NV
bromomethane	74-83-9	2 00E+03	2 00E+04	4 00E+00	2 00E+01	2 00E+02
carbon disulfide	75-15-0	2 00E+04	2 00E+03	4.00E+00	2 00E+02	2 00E+01
carbon tetrachloride	56-23-5	2 00E+04	2 00E+03	4 00E+00	2 00E+02	2.00E+01
chloral	75-87-6	5 00E+03	NV	1 00E+03	5 00E+03	NV
chlordane	57-74-9	5 00E+08	5 00E+08	1 00E+00	5 00E+04	5 00E+04
chlorobenzene	108-90-7	3 50E+00	3 50E+01	7 00E-04	3 50E-02	3.50E-01
chloroethane	75-00-3	3 50E-03	NV	7.00E-04	3.50E-03	NV
chloroform	67-66-3	2 00E+02	2 00E+01	4.00E+01	2.00E+02	2.00E+01
chloromethane	74-87-3	3 50E-02	3.50E-03	7.00E-03	3 50E-02	3.50E-03
chloromethyl methyl ether	107-30-2	3.50E-01	NV	7.00E-01	3.50E-01	NV
cresol (m-cresol) *	108-39-4	5.00E+01	5.00E+02	1.00E-01	5.00E-01	5 00E+00
crysene	218-01-9	NV	5 00E+06	NV	NV	5 00E+02
cumene	98-82-8	2 00E+05	2.00E+04	4.00E+00	2.00E+03	2.00E+02
cyanogen chloride	506-77-4	NV	NV	NV	NV	NV
cyclohexanone	108-94-1	5.00E+00	5.00E+00	1.00E+00	5.00E+00	5 00E+00
DDD	72-54-8	5.00E+06	5.00E+08	1.00E-02	5.00E+02	5 00E+04
DDT	50-29-3	5.00E+07	5.00E+08	1.00E-01	5.00E+03	5.00E+04
dichlorodifluoromethane	75-71-8	2.00E+02	NV	4.00E-02	2.00E+00	NV
dichloroethyl ether	111-44-4	NV	NV	NV	NV	NV
dichloroisopropyl ether	108-60-1	NV	NV	NV	NV	NV
dichloromethyl ether	542-88-1	NV	NV	NV	NV	NV
dieldrin	60-57-1	5 00E+08	5.00E+08	1.00E+00	5 00E+04	5.00E+04
diphenyl nitrosamine	86-30-6	5.00E+03	5.00E+04	1.00E-01	5.00E+01	5.00E+02
epichlorohydrin	106-89-8	NV	NV	NV	NV	NV
ethyl acetate	141-78-6	2 00E-01	2 00E-01	4 00E-01	2.00E-01	2 00E-01
ethyl benzene	100-41-4	2 00E+02	2 00E+03	4.00E-02	2.00E+00	2 00E+01
ethylene dibromide	106-93-4	NV	NV	NV	NV	NV
ethylene glycol	107-21-1	5 00E-01	5 00E+00	1.00E+00	5 00E-01	5 00E+00

Exhibit 1 HRS Hazard Data and Pathway Scores for Halogenated Organics

Chemical	CAS No	HRS Pathway Scores				
		SW/OF/HFC (Tox/Pers/Bio)	SW/OF/Env (Etox/Per/Bio)	SW/OW/DWT (Tox/Mob/Per)	SW/OW/HFC (Tox/Mob/Per/Bio)	SW/OW/Env (Etox/Mob/Per/Bio)
ethylene glycol monomethyl ether	110-80-5	5 00E+00	5 00E-01	1.00E+01	5 00E+00	5 00E-01
ethyl ether	60-29-7	2 00E+00	2 00E-01	4 00E+00	2 00E+00	2 00E-01
fluoranthene	206-44 0	5.00E+05	5 00E+07	1 00E-02	5 00E+01	5 00E+03
fluorene	86-73-7	5 00E+05	5 00E+06	1 00E+00	5 00E+03	5 00E+04
formaldehyde	50-00-0	5 00E+00	5 00E+01	1 00E+01	5 00E+00	5 00E+01
heptachlor	76-44-8	5 00E+06	5 00E+08	2 00E+01	1 00E+05	1 00E+07
heptachlor epoxide	1024-57-3	5 00E+04	5 00E+08	1 00E+04	5 00E+04	5 00E+08
hexachlorobenzene	118-74-1	5 00E+06	5 00E+05	1.00E-01	5 00E+02	5 00E+01
hexachlorobutadiene (hexachloro-1,3-butadiene)	87-68-3	5.00E+04	5.00E+07	1 00E-01	5 00E+00	5 00E+03
hexachlorocyclopentadiene	77-47-4	5.00E+07	5 00E+05	1 00E+02	5 00E+05	5 00E+03
hexachloroethane	67-72-1	2.00E+05	2.00E+05	4 00E+00	2 00E+03	2 00E+03
hexachloropentadiene	77-47-4	5.00E+07	5 00E+05	1 00E+02	5 00E+05	5 00E+03
hydrochloric acid	7647-01-0	2.00E+02	2.00E-01	4 00E+02	2 00E+02	2 00E 01
hydrogen sulfide	7783-06-4	2.00E+03	2.00E+02	4.00E+03	2 00E+03	2 00E+02
isobutanol	78-83-1	2 00E+00	2 00E+00	4 00E+00	2 00E+00	2 00E+00
lindane	58-89-9	5 00E+06	5 00E+06	1 00E+01	5 00E+03	5 00E+03
methanol	67 56 1	5 00E-01	5 00E-01	1 00E+00	5 00E-01	5 00E-01
methoxychlor	72 43 5	5 00E+06	5 00E+08	1.00E-02	5.00E+02	5 00E+04
methyl chlorocarbonate	79 22 1	2 00E+01	NV	NV	NV	NV
methylene bis(2-chloroaniline) 4 4	101 14 4	2 00E+05	NV	4 00E-02	2 00E+01	NV
methylene chloride	75 09 2	2 00E+01	2 00E+00	4 00E+00	2.00E+01	2 00E+00
methyl ethyl ketone	78 93 3	2 00E+00	2.00E-01	4.00E+00	2 00E+00	2 00E-01
methyl isobutyl ketone	108-10-1	2.00E+01	2 00E+00	4 00E+00	2.00E+01	2 00E+00
methyl methacrylate	80-62-6	2.00E+01	2.00E+00	4.00E+00	2.00E+01	2 00E+00
n butanol	71-36-3	5.00E+01	5.00E+00	1.00E-01	5.00E-01	5.00E-02
naphthalene	91-20-3	2.00E+04	2.00E+05	4 00E-01	2 00E+02	2.00E+03
nitrobenzene	98-95-3	5.00E+03	2.50E+01	1.00E+01	5.00E+01	2.50E-01
pentachlorobenzene	608-93-5	5.00E+06	5.00E+05	1.00E+01	5.00E+04	5.00E+03
pentachloroethane	76-01-7	2.00E+02	2.00E+03	4.00E-02	2.00E+00	2.00E+01
pentachloronitrobenzene	82-68-8	5.00E+05	NV	1.00E+01	5.00E+03	NV
pentachlorophenol	87-86-5	5.00E+04	5.00E+04	1.00E+00	5.00E+02	5.00E+02
p-Chloroaniline	106-47-8	5.00E+03	5.00E+04	1.00E+03	5.00E+03	5.00E+04
phenanthrene	85-01-8	NV	2.00E+06	NV	NV	2.00E+02
phenol	108-95-2	5.00E+00	5.00E+04	1.00E+00	5.00E+00	5.00E+04
pyrene	129-00-0	5.00E+03	NV	1.00E-02	5.00E-01	NV
pyridine	110-86-1	5.00E+02	5.00E+01	1 00E+03	5.00E+02	5.00E+01
styrene	100-42-5	2.00E+02	2 00E+03	4.00E-02	2.00E+00	2.00E+01
sulfuric acid	7664-93-9	2.00E+02	2 00E+00	4.00E+02	2 00E+02	2 00E+00
toluene	108-88-3	2.00E+02	2.00E+03	4.00E-02	2.00E+00	2 00E+01
toxaphene	8001-35-2	5 00E+07	5 00E+08	1 00E+01	5.00E+05	5 00E+06
tetrachloroethene	127-18-4	2.00E+03	2 00E+03	4.00E-01	2 00E+01	2 00E+01
tetrahydrofuran	109-99-9	5 00E+02	NV	1.00E+00	5.00E+02	NV
trans-1,2-dichloroethylene	156-60-5	2 00E+03	2 00E+01	4.00E+01	2 00E+03	2 00E+01
trichloroethylene	79-01-6	2 00E+02	2.00E+03	4 00E-02	2 00E+00	2 00E+01

Exhibit 1 HRS Hazard Data and Pathway Scores for Halogenated Organics

Chemical	HRS Pathway Scores					
	CAS No	SW/OP/HFC (Tox/Pers/Bio)	SW/OP/Env (Itox/Pers/Bio)	SW/GW/DWT (Tox/Mob/Pers)	SW/GW/HFC (Tox/Mob/Pers/Bio)	SW/GW/Env (Itox/Mob/Pers/Bio)
trichlorofluoromethane	75-69-4	NV	NV	NV	NV	NV
vinyl chloride	75-01-4	3.50E+02	NV	7.00E-01	3.50E+00	NV
xylene (m-xylene) **	108-38-3	2.00E+02	2.00E+04	4.00E-03	2.00E+00	2.00E+02
xylene (p-xylene) **	106-42-3	2.00E+02	1.60E+03	4.00E-02	2.00E+00	1.60E+01
2,4-Dimethyl phenol	0-0-0	5.00E+04	5.00E+04	1.00E+00	5.00E+02	5.00E+02
Benzo(a)anthracene	0-0-0	5.00E+07	5.00E+08	1.00E+03	5.00E+07	5.00E+08
Butyl benzyl phthalate	0-0-0	5.00E+03	5.00E+04	1.00E-03	5.00E-01	5.00E+00
Dibenz(a,h) anthracene	0-0-0	5.00E+08	NV	1.00E+00	5.00E+04	NV
Dimethyl phthalate	0-0-0	5.00E+01	5.00E+02	1.00E-02	5.00E-01	5.00E+00
Fluorene	0-0-0	2.00E+00	NV	4.00E+00	2.00E+00	NV
Maleic anhydride	0-0-0	3.50E-03	3.50E-04	NV	NV	NV
Phorate	0-0-0	5.00E+06	5.00E+05	1.00E+02	5.00E+04	5.00E+04
Phthalic anhydride	0-0-0	2.00E-01	NV	4.00E-01	2.00E-01	NV
Toluene diisocyanate	0-0-0	2.00E+02	2.00E-01	NV	NV	NV
2,3,7,8-Tetrachlorodibenzo(p)dioxin	0-0-0	5.00E+07	NV	1.00E+00	5.00E+03	NV
2,4,5-Trichlorophenol	0-0-0	5.00E+03	5.00E+06	1.00E-01	5.00E+01	5.00E+03
Dichlorodifluoromethane	0-0-0	2.00E+02	NV	4.00E-02	2.00E+00	NV
Tetrachlorobenzene	0 0 0	5.00E+07	5.00E+05	1.00E+00	5.00E+03	5.00E+01
Vinyl Chloride	0 0 0	3.50E+01	NV	7.00E-02	3.50E-01	NV

* The SCDM values for m-cresol were used because no values were available for mixed cresols, m-cresol is more persistant than other isomers.
** The SCDM values for m-xylene and p-xylene were used because no values were available for mixed xylenes. These isomers were used because m-xylene is more bioaccumulative, and p-xylene is more toxic than the other isomers.

"Toxicity" refers to the HRS human toxicity factor score [max score = 1E+4]

"GW Mob" refers to the HRS ground-water mobility factor score based on water solubility and distribution coefficient (Kd) [max score = 1]

"Air Mob" refers to the air gas mobility factor score based on the vapor pressure of the gaseous hazardous substitute [max score = 1]

"Persist" refers to the HRS surface water persistence factor score based on a substance's half-life (based on biodegredation, hydrolysis, photolysis, and volatilization) and Kow [max score = 1]

"FCBioacc" refers to the HRS bioaccumulation potential factor score evaluated in the human food chain threat of the surface water pathway [max score=5E+4]

"EnvBioacc" refers to the HRS bioaccumulation potential factor score evaluated in the environmental threat of the surface water pathway [max score=5E+4]

"Ecotox" refers to the HRS ecosystem toxicity factor score evaluated in the environmental threat of the surface water pathway [max score = 1E+4]

"GW (Tox/Mob)" refers to the HRS Toxicity/Mobility factor score evaluated in the ground-water pathway, and is obtained by multiplying its factor value components [max score = 1E+4]

"Air (Tox/Mob)" refers to the HRS Toxicity/Mobility factor score evaluated in the air pathway, and is obtained by multiplying its factor value components [max score = 1E+4]

"SW/OP/DWT (Tox/Per)" refers to the Toxicity/Persistence factor score evaluated in the overland/flood migration component of the surface water pathway drinking water threat, and is obtained by multiplying its factor value components [max score = 10,000]

"SW/OP/HFC (Tox/Pers/Bio)" refers to the Toxicity/Persistence/Bioaccumulation factor score evaluated in the overland/flood migration component of the surface water pathway human food chain threat, and is obtained by multiplying its factor value components [max score=5E+8]

"SW/OP/Env (Itox/Pers/Bio)" refers to the Ecosystem Toxicity/Persistence/Bioaccumulation factor value evaluated in the overland/flood migration component of the surface water pathway environmental threat, and is obtained by multiplying its factor value components [max score=5E+8]

"SW/GW/DWT (Tox/Mob/Per)" refers to the Toxicity/Mobility/Persistence factor score of the ground water to surface water migration component of the surface water pathway drinking waster threat, and is obtained by multiplying its factor components [max score = 1E+4]

"SW/GW/HFC (Tox/Mob/Per/Bio)" refers to the Toxicity/Mobility/Persistence/Bioaccumulation factor score evaluated in the ground water to surface water migration component of the surface water pathways human food chain threat, and is obtained by multiplying its factor value components [max score = 5E+8]

"SW/GW/Env (Itox/Mob/Per/Bio)" refers to the Ecosystem Toxicity/Mobility/Persistence/Bioaccumulation factor score evaluated in the ground water to surface water migration component of the surface water pathway environmental threat, and is obtained by multiplying its factor value components [max score = 5E+8]

"NV" = no value; "NA" = not applicable

Exhibit 2 HRS Hazard Data and Pathway Scores for Metals

Chemical	Source or Ranks													
	HRS Factor Scores													
	CAS No	Toxicity	GW Mob	Persist	PCBioacc	EnvBioacc	Ecotox	GW (Tox/Mob)	SW/OP/DWT (Tox/Per)	SW/OP/HPC (Tox/Pers/Bio)	SW/OP/Env (Etox/Per/Bio)	SW/GW/DWT (Tox/Mob/Per)	SW/GW/HPC (Tox/Mob/Per/Bio)	SW/GW/Env (Etox/Mob/Per/Bio)
aluminum	7429-90-5	NV	NV	1	5.00E+01	5.00E+02	1.00E+01	NA	NA	NA	5.00E+03	NA	NA	NA
antimony	7440-36-0	1.00E+04	1.00E-02	1	5.00E-01	5.00E-01	NV	1.00E+02	1.00E+04	5.00E+03	NA	1.00E+02	5.00E+01	NA
arsenic	7440-38-2	1.00E+04	1.00E-02	1	5.00E+00	5.00E+01	1.00E+01	1.00E+02	1.00E+04	5.00E+04	5.00E+02	1.00E+02	5.00E+02	5.00E+00
barium	7440-39-3	1.00E+01	1.00E-02	1	5.00E-01	5.00E-01	1.00E+00	1.00E-01	1.00E+01	5.00E+00	5.00E-01	1.00E-01	5.00E-02	5.00E-03
beryllium	7440-41-7	1.00E+04	1.00E-02	1	5.00E+01	5.00E+01	NV	1.00E+02	1.00E+04	5.00E+05	NA	1.00E+02	5.00E+03	NA
cadmium	7440-43-9	1.00E+04	2.00E-01	1	5.00E+03	5.00E+03	1.00E+03	2.00E+03	1.00E+04	5.00E+07	5.00E+06	2.00E+03	1.00E+07	1.00E+06
chromium	16065-83-1	1.00E+00	2.00E-05	0.4	5.00E+04	5.00E+04	1.00E+01	2.00E-05	4.00E-01	2.00E+04	2.00E+05	8.00E-06	4.00E-01	4.00E+00
chromium	18540-29-9	1.00E+04	NV	1	5.00E+00	5.00E+00	1.00E+02	NA	1.00E+04	5.00E+04	5.00E+02	NA	NA	NA
copper	7440-50-8	NV	1.00E-02	1	5.00E+04	5.00E+04	1.00E+02	NA	NA	NA	5.00E+06	NA	NA	5.00E+04
lead	7439-92-1	1.00E+04	2.00E-05	1	5.00E+01	5.00E+03	1.00E+03	2.00E-01	1.00E+04	5.00E+05	5.00E+06	2.00E-01	1.00E+01	1.00E+02
mercury	7439-97-6	1.00E+04	2.00E-05	1	5.00E+04	5.00E+04	1.00E+04	2.00E-01	1.00E+04	5.00E+08	5.00E+08	2.00E-01	1.00E+04	1.00E+04
nickel	7440-02-0	1.00E+04	2.00E-05	1	5.00E-01	5.00E+02	1.00E+01	2.00E-01	1.00E+04	5.00E+03	5.00E+03	2.00E-01	1.00E-01	1.00E-01
selenium	7782-49-2	1.00E+02	1.00E-02	1	5.00E+03	5.00E+03	1.00E+02	1.00E+00	1.00E+02	5.00E+05	5.00E+05	1.00E+00	5.00E+03	5.00E+03
silver	7440-22-4	1.00E+02	2.00E-07	1	5.00E+01	5.00E+01	1.00E+04	2.00E-05	1.00E+02	5.00E+03	5.00E+05	2.00E-05	1.00E-03	1.00E-01
thallium	7440-28-0	1.00E+03	1.00E-04	1	5.00E+02	5.00E+02	NV	1.00E-01	1.00E+03	5.00E+05	NA	1.00E-01	5.00E+01	NA
vanadium	7440-62-2	1.00E+02	NV	1	5.00E-01	5.00E-01	NV	NA	1.00E+02	5.00E+01	NA	NA	NA	NA
zinc	7440-66-6	1.00E+01	2.00E-03	1	5.00E+01	5.00E+02	1.00E+01	2.00E-02	1.00E+01	5.00E+03	5.00E+03	2.00E-02	1.00E+01	1.00E+01

"Toxicity" refers to the HRS human toxicity factor score [max score = 10,000]

"GW Mob" refers to the HRS ground-water mobility factor score based on water solubility and distribution coefficient (Kd) [max score = 1]

"Persist" refers to the HRS surface water persistence factor score based on a substance's half-life (based on biodegredation, hydrolysis, photolysis, and volatization) and Kow [max score = 1]

"PC Bioacc" refers to the HRS bioaccumulation potential factor score evaluated in the human food chain threat of the surface water pathway [max score=5E+4]

"Env Bioacc" refers to the HRS bioaccumulation potential factor score evaluated in the environmental threat of the surface water pathway [max score=5E+4]

"Ecotox" refers to the HRS ecosystem toxicity factor score evaluated in the environmental threat of the surface water pathway [max score = 10,000]

"GW (Tox/Mob)" refers to the HRS Toxicity/Mobility factor score evaluated in the ground-water pathway, and is obtained by multiplying its factor value components [max score = 10,000]

"SW/OP/DWT (Tox/Per)" refers to the Toxicity/Persistence factor score evaluated in the overland/flood migration component of the surface water pathway drinking water threat, and is obtained by multiplying its factor value components [max score = 10,000]

"SW/OP/HPC (Tox/Pers/Bio)" refers to the Toxicity/Persistence/Bioaccumulation factor score evaluated in the overland/flood migration component of the surface water pathway human food chain threat, and is obtained by multiplying its factor value components [max score = 5E+8]

"SW/OP/Env (Etox/Pers/Bio)" refers to the Ecosystem Toxicity/Persistence/Bioaccumulation factor value evaluated in the overland/flood migration component of the surface water pathway environmental threat, and is obtained by multiplying its factor value components [max score = 5E+8]

"SW/GW/DWT (Tox/Mob/Per)" refers to the Toxicity/Mobility/Persistence factor score of the ground water to surface water migration component of the surface water pathway drinking water threat, and is obtained by multiplying its factor value components [max score = 10,000]

"SW/GW/HPC (Tox/Mob/Per/Bio)" refers to the Toxicity/Mobility/Persistence/Bioaccumulation factor score evaluated in the ground water to surface water migration component of the surface water pathway human food chain threat, and is obtained by multiplying its factor value components [max score = 5E+8]

"SW/GW/Env (Etox/Mob/Per/Bio)" refers to the Ecosystem Toxicity/ Mobility/ Persistance/Bioaccumulation factor score evaluated in the ground water to surface water migration component of the surface water pathway environment threat, and is obtained by multiplying its factor value components [max score = 5E+8]

"NV" = no value, "NA" = not applicable

APPENDIX 9
STATES AND REGIONS IN WHICH TOP 100 RANKED WASTESTREAM COMBINATIONS ARE GENERATED

States and Regions for Top 100 Ranked Wastestream Combinations

Rank	RCRA Code	SIC Code	Source Code	Form Code	Volume (tons)	Hazard Score	State	EPA Region
1	D001 F001 F002 F003 F005 U001 U002 U003 U019 U028	2869	A33	B219	14,217	7.09e+13	TX	6
2	D002 D006	2833	A32	B207	3,724	3.72e+13	CT	1
3	K022	2869	A33	B606	23,281	2.32e+13	PA	3
4	D001 D002 D019 D032 D033 D034 D039 F002	2869	A33	B219	3,866	1.93e+13	TX	6
5	D001 D007 D008 D018 D022 D026 D027 D028 D033 D036	9999	A99	B219	7,001	1.05e+13	IN	5
6	D001 D002 D003 F002 F020 F024 K017 K018 K020 K028	2821	A37	B219	48,039	4.79e+12	TX	6
7	F003 F005	Unkwn	Unkwn	B219	17,218	2.58e+12	CT MA NJ NY PA VA WV	1 1 2 2 3 3 3
8	D001 D008 F003 F005	4953	A73	B203	4,880	2.43e+12	KY	4
9	D001 D002	2869	A31	B207	3,873	1.93e+12	VA	3
10	Unknown	Unkwn	Unkwn	B206	84,191	1.68e+12	CT RI NJ DE MD PA VA IL TX IA KS MO CA	1 1 2 3 3 3 3 5 6 7 7 7 9
11	D001 D002	2869	A35	B219	95,042	1.42e+12	TX	6
12	D001 D018 D019 D039 F024	2869	A74	B202	26,708	1.33e+12	LA	6
13	D001 D028 F037 F038	2911	A89	B205	6,785	6.77e+11	TX	6
14	K002	2865	A33	B203	6,554	6.54e+11	LA	6
15	D001 D005 D006 D007 D008 D018 D026 D035 F001 F002	Unkwn	Unkwn	B219	31,348	6.26e+11	MI	5
16	D019 D022 D032 D039 D043 K018 K020	2869	A33	B219	3,132	6.25e+11	TX	6
17	D001 D002 U008 U113	2869	A33	B101	189,524	5.67e+11	TX	6

States and Regions for Top 100 Ranked Wastestream Combinations (continued)

Rank	RCRA Code	SIC Code	Source Code	Form Code	Volume (tons)	Hazard Score	State	EPA Region
18	D001 K013 U003	2869	A33	B219	5,554	5.54e+11	TX	6
19	D001 F001 F002 F003	Unkwn	Unkwn	B204	10,782	5.38e+11	FL	4
							KY	4
							IN	5
							OH	5
							WI	5
							IA	7
20	D001 D008	2821	A33	B602	13,395	5.35e+11	KY	4
21	K048 K049 K051	Unkwn	Unkwn	Unkwn	3,393	5.08e+11	OH	5
							LA	6
22	F003 F005	2819	A	B	6,101	4.57e+11	TN	4
23	D001 F003 F005	Unkwn	Unkwn	B203	5,692	4.54e+11	CT	1
							MA	1
							ME	1
							NJ	2
							NY	2
							MD	3
							PA	3
							VA	3
							AL	4
							FL	4
							MS	4
							NC	4
							SC	4
							TN	4
							IN	5
							MI	5
							MN	5
							OH	5
							LA	6
							KS	7
							MO	7
							CO	8
							ND	8
							CA	9

Rank	RCRA Code	SIC Code	Source Code	Form Code	Volume (tons)	Hazard Score	State	EPA Region
24	D001 D004 D005 D006 D007	Unkwn	Unkwn	B204	22,251	4.44e+11	TN IN MI	4 5 5
25	D001 D002 F002 F003 F005 U002 U012 U031 U044 U080	2834	A37	B201	4,163	4.15e+11	GA	4
26	D001 D002 D003 D008 D018 D023 D024 D025 D026	2869	A33	B219	18,825	3.76e+11	TX	6
27	D001 D018 D019 D022 D028	2869	A37	B202	8,416	3.36e+11	LA	6
28	K051	2911	A89	B603	6,217	2.92e+11	TX	6
29	D001 D002 D007 D018 D021 F002 F003 F005	2865	A31	B204	4,781	2.86e+11	AR	6
30	D001 D002 D003 D018 D026 D035 F002 F003 F004 F005	2869	A33	B219	14,194	2.83e+11	TX	6
31	D001 D004 D005 D006 D007 D008 D009 D010 D011 D016	Unkwn	Unkwn	B202	6,591	2.63e+11	MO	7
32	D001 F003 F005	Unkwn	Unkwn	B204	8,747	2.62e+11	NJ VA WV KY IL IN MI OH MO NE CA	2 3 3 4 5 5 5 5 7 7 9
33	D001 D002	2819	A37	B219	15,997	2.39e+11	TX	6
34	K049	2911	A75	B202	3,316	2.32e+11	IL	5
35	D001 D004 D005 D006 D007 D008 D009 D010 D011 D018	Unkwn	Unkwn	B202	5,565	2.22e+11	AL TN CA	4 4 9
36	D001 D005 D006 D007 D008	7389	A89	B204	10,883	2.17e+11	TX	6
37	D018 F037 F038 K048 K049 K050 K051	2911	A75	B603	10,580	2.11e+11	LA	6
38	D001 D004 D005 D006 D007 D008 D009 D010 D016 F001	7389	A71	B219	4,743	1.89e+11	TX	6
39	D001 D002 D003 D004 D005 D006 D007 D008 D009 D010	4953	A99	B114	4,564	1.82e+11	TX	6
40	D001 D004 D005 D006 D007 D008 D010 D011 D018 D035	2899	A89	B204	4,531	1.81e+11	AL	4
41	D001 D002 D007 D018 D021 F002 F003 F005	2865	A34	B204	4,316	1.72e+11	AR	6

Rank	RCRA Code	SIC Code	Source Code	Form Code	Volume (tons)	Hazard Score	State	EPA Region
42	D001 D007 D008 D018	2911	A89	B204	8,564	1.71e+11	OH	5
43	D001 D005 D006 D007 D008	Unkwn	Unkwn	B407	7,826	1.56e+11	MI AR	5 6
44	D001 D018 K048 K049	2911	Unkwn	B204	3,669	1.46e+11	OH	5
45	Unknown	3221	A54	B206	7,914	1.18e+11	NJ	2
46	D001 F024	2819	A33	B219	14,893	1.04e+11	LA	6
47	K048	2911	A75	B503	19,996	9.98e+10	TX	6
48	D001 D004 D005 D006 D007	Unkwn	Unkwn	B407	4,509	9.00e+10	GA TX	4 6
49	D001 D002	2869	A33	B219	7,412	8.87e+10	VA TX	3 6
50	D005 D006 D008 F001	4953	Unkwn	B204	4,348	8.68e+10	OH	5
51	D018 D038 K022 K083	2865	A	B	17,303	8.63e+10	OH	5
52	D001 D005 D006 D007	Unkwn	Unkwn	B204	3,775	7.53e+10	OH	5
53	D001 D011 D018 D021 D022	3861	A49	B204	9,390	7.49e+10	NY	2
54	D001 F001 F003 F005	Unkwn	Unkwn	B204	5,956	7.43e+10	RI NY IL MI OH NM	1 2 5 5 5 6
55	D001 D002 D007	2869	A33	B602	36,709	7.32e+10	TX	6
56	D001 D005 D006 D007 D008 F001 F002 F003 F004 F005	7389	A71	B206	3,518	7.02e+10	TX	6
57	D001 D005 D006 D007 D008 F003 F005	2821	A73	B602	3,410	6.80e+10	WI	5
58	D001 D002 D005 D006	4953	Unkwn	B204	3,295	6.57e+10	OH	5
59	D001 D002 D019 D022 D027 D028 D029 D032 D033 D034	2869	A99	B494	6,435	6.42e+10	TX	6
60	D001 D006 D008 F002	Unkwn	Unkwn	B403	3,168	6.32e+10	OH TX	5 6
61	F001 F002 F003 F005	Unkwn	Unkwn	B204	6,975	6.26e+10	PR FL IN TX	2 4 5 6

States and Regions for Top 100 Ranked Wastestream Combinations (continued)

Rank	RCRA Code	SIC Code	Source Code	Form Code	Volume (tons)	Hazard Score	State	EPA Region
62	D001 D005 D006 D007 D008 D011 D022 D035 D039 F001	Unkwn	Unkwn	Unkwn	3,124	6.23e+10	OH	5
63	D001 D002 D007 D008 D018 D035 F001 F003 F005 U009	2869	A37	B219	5,679	5.67e+10	TX	6
64	D001 F001 F002 F005	Unkwn	Unkwn	B204	10,929	5.45e+10	WI Q	5 11
65	D008	Unkwn	Unkwn	Unkwn	5,357	5.34e+10	MA VT NY FL KY NC SC TN IL IN MI MN OH LA OK TX KS MO NE AZ CA Q	1 1 2 4 4 4 4 4 5 5 5 5 5 6 6 6 7 7 7 9 9 11
66	D001 F004	2821	A33	B602	3,990	5.18e+10	NY	2
67	D001 D007 D008 F001 F002 F003 F005	9999	Unkwn	B202	4,866	4.85e+10	TN	4
68	K022	2865	A33	B602	9,432	4.71e+10	TX	6
69	K022	2869	A33	B219	10,846	3.25e+10	TX	6
70	D001 D002 D007	2869	A33	B219	16,099	3.21e+10	TX	6
71	D001 F001 F002 F003	2899	A89	B204	5,825	2.91e+10	AL	4
72	D001 D002 F003 F005 K038 P094	2879	A37	B101	35,136	2.80e+10	MO	7
73	D001 D002 D003 D004 D005 D006 D007 D008 D009 D010	2869	A33	B105	13,182	2.63e+10	TX	6
74	K017 K019 K020	2869	A33	B601	13,073	2.61e+10	TX	6

States and Regions for Top 100 Ranked Wastestream Combinations (continued)

Rank	RCRA Code	SIC Code	Source Code	Form Code	Volume (tons)	Hazard Score	State	EPA Region
75	D001	2512	A92	B403	4,322	2.59e+10	NC	4
76	D001 D018 D043 F001 F002 F003 F004 F005	Unkwn	Unkwn	B204	15,509	2.48e+10	VA	3
77	F001 F002 F003	Unkwn	Unkwn	Unkwn	4,822	2.41e+10	NJ GA TN IN OH TX CO	2 4 4 5 5 6 8
78	K022	2865	A35	B602	4,609	2.30e+10	TX	6
79	D001 F003 F005	3053	A56	B403	3,465	2.28e+10	VA	3
80	D002 D021 D028 F003 F005	2879	A37	B101	130,948	2.22e+10	MO	7
81	D001	2869	A35	B207	10,732	2.14e+10	TX	6
82	D001	2869	A35	B606	3,175	1.27e+10	MI	5

Rank	RCRA Code	SIC Code	Source Code	Form Code	Volume (tons)	Hazard Score	State	EPA Region
83	D001	Unkwn	Unkwn	Unkwn	25,371	1.01e+10	CT	1
							MA	1
							RI	1
							VT	1
							NJ	2
							NY	2
							PA	3
							VA	3
							WV	3
							AL	4
							FL	4
							GA	4
							KY	4
							MS	4
							NC	4
							SC	4
							TN	4
							IL	5
							IN	5
							MI	5
							MN	5
							OH	5
							WI	5
							AR	6
							LA	6
							TX	6
							IA	7
							KS	7
							MO	7
							NE	7
							MT	8
							WY	8
							AZ	9
							CA	9
							NV	9
							WA	10
							FC	11
							Q	11

Rank	RCRA Code	SIC Code	Source Code	Form Code	Volume (tons)	Hazard Score	State	EPA Region
84	D001 F001 F002 F003 F005	Unkwn	Unkwn	B202	5,922	9.45e+09	NJ IL IN OH WI	2 5 5 5 5
85	D001 D002	Unkwn	Unkwn	Unkwn	3,477	6.94e+09	MD KY TN IL OH WI LA OK TX CA	3 4 4 5 5 5 6 6 6 9
86	D001 F002 F003 F005	2384	A37	B101	18,747	5.61e+09	PR IN	2 5
87	D001 F002 F003 F005	2833	A35	B101	26,284	2.10e+09	IN	5
88	D001 D022	2869	A37	B202	3,414	1.16e+09	LA	6
89	F002 F005	2834	A37	B101	28,640	1.14e+09	IN	5
90	D001 D002 D003	2879	A37	B102	27,247	8.16e+08	TX	6
91	D002	2869	A09	B207	8,001	7.98e+08	TX	6
92	D001	2869	A35	B219	12,842	6.41e+08	WV AL LA TX	3 4 6 6
93	D001 D002 D003 D018 D021 D023 D024 D025 D026 D035	2869	A33	B219	7,418	5.03e+08	TX	6
94	K027	2865	A33	B409	11,123	4.44e+08	LA	6
95	D001 D002 D003 D005 D018 D021 D023 D024 D025 D026	2869	Unkwn	Unkwn	6,075	4.12e+08	OH	5
96	D001 D002 F003	2819	A	B	5,323	1.06e+08	TN	4
97	K027	2865	A33	B403	4,457	8.89e+07	WV	3
98	D001 F002 F003	2833	A35	B101	18,154	5.43e+07	IN	5
99	F002	2879	A35	B101	37,447	1.79e+07	CA	9

States and Regions for Top 100 Ranked Wastestream Combinations (continued)

Rank	RCRA Code	SIC Code	Source Code	Form Code	Volume (tons)	Hazard Score	State	EPA Region
100	F002 F003 F005	2384	A37	B101	6,414	5.12e+06	PR	2
						1.9086e+14		